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THE

EDINBURGH NEW DISPENSATORY:

Carey tom CONTAINING 1805.

I. THE ELEMENTS OF PHARMACEUTICAL CHEMISTRY.

II. THE MATERIA MEDICA; OR, THE NATURAL, PHARMACEUTICAL AND MEDICAL HISTORY OF THE DIFFERENT SUBSTANCES EMPLOYED IN MEDICINE.

III. THE PHARMACEUTICAL PREPARATIONS AND COMPOSITIONS.

INCLUDING

Complete and Accurate Translations of the Octavo Edition of the London Pharmacopœia, published in 1791; Dublin Pharmacopœia, published in 1794; and of the New Edition of the Edinburgh Pharmacopœia, published in 1803.

Illustrated and explained in the Language, and according to the Principles, of Modern Chemistry.

WITH MANY NEW AND USEFUL TABLES,

And ſeveral COPPERPLATES, explaining the new Syſtem of Chemical Characters, and repreſenting the moſt uſeful Pharmaceutical Apparatus.

By ANDREW DUNCAN, Jun. M.D.

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS AND ROYAL SOCIETY OF EDINBURGH, AND ASSOCIATE OF THE LINNEAN SOCIETY OF LONDON.

W. LEWIS

Second edition,
enlarged and much improved.

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TO

ANDREW DUNCAN, M.D.

PROFESSOR OF THE INSTITUTIONS OF MEDICINE
IN THE UNIVERSITY OF EDINBURGH,

THIS WORK

IS MOST DUTIFULLY AND AFFECTIONATELY INSCRIBED

BY

HIS SON.

PREFACE.

DR. LEWIS publiſhed the firſt edition of his *New Diſpenſatory* in 1753. The principal part of the work was a Commentary upon the London and Edinburgh Pharmacopœias, of both of which it contained a complete and accurate tranſlation. A conciſe ſyſtem of the Theory and Practice of Pharmacy was prefixed, as an introduction; and directions for extemporaneous preſcription, with many elegant examples, and a collection of efficacious but cheap remedies, for the uſe of the poor, were added as an Appendix.

The manner in which the whole was executed, placed Dr. LEWIS at the head of the reformers of Chemical Pharmacy; for he contributed more than any of his predeceſſors to improve that ſcience, both by the judicious criticiſm with which he combated the erroneous opinions prevalent in his time, and by the actual and important additions he made to that branch of our knowledge. He was juſtly rewarded by the decided approbation of the public. During the Author's lifetime many editions were publiſhed, each ſucceeding one receiving the improvements which the advancement of the ſciences connected with Pharmacy ſuggeſted.

After the death of Dr. LEWIS; Dr. WEBSTER, Dr. DUNCAN, and Dr. ROTHERAM, ſucceſſively contributed to maintain the reputation of the work, by taking advantage of the diſcoveries made in Natural Hiſtory and Chemiſtry, and by making thoſe alterations which new editions of the Pharmacopœias, on which it was founded, rendered neceſſary. From the place of their publication, and to diſtinguiſh them from the original work of Dr. LEWIS, which was ſtill reprinted without alteration in London, theſe improved editions were entitled, *The* EDINBURGH *New Diſpenſatory*.

When the Edinburgh College ſome time ago determined to publiſh a new edition of their Pharmacopœia, the bookſellers who purchaſed the copy-right of that work being deſirous that it ſhould be accompanied by a correſponding edition of the Edinburgh New Diſpenſatory, applied to the preſent Editor to make the neceſſary alterations. This he readily undertook, and the number of the alterations made will ſhew, that if he has not fulfilled what was expected from him, it has been owing to want of ability, and not to want of exertion.

The general plan of the work remains the ſame. It is divided into three parts. The firſt contains Elements of Pharmacy; the ſecond, the Materia Medica; and the laſt, the Preparations and Compoſitions.

The *firſt* of theſe is entirely new, nothing being retained but the title. It is divided into two ſections. The firſt contains a very conciſe account of ſome of the general doctrines of *Chemiſtry*, and of the properties of all ſimple bodies, and the generic characters of compound bodies. In the ſecond part, the *Operations of Pharmacy*, and the neceſſary apparatus, are deſcribed; and an Appendix is added, containing many very uſeful Tables, and the Explanation of the Plates.

We now poſſeſs ſo many excellent elementary works on Chemiſtry, both tranſlations, and original works, ſuch as thoſe of Dr. THOMSON, Mr. MURRAY, and Mr. NICHOLSON, that it is perhaps neceſſary to explain why an Epitome of Chemiſtry has been introduced into this work. Not only is its introduction authoriſed by the example of former editions, but in attempting to explain in a ſcientific manner the operations of Pharmacy, we found ourſelves ſo frequently obliged to mention the general principles and facts of Chemiſtry, that, to avoid tedious repetitions, it became neceſſary either to refer to ſome elementary book already publiſhed, or to prefix to this work a ſhort abſtract of Chemical Science. The latter alternative was preferred, as it would form a bond of connection between the detached ſubjects treated of in the other parts of the work, and as it appeared, that, by means of a due attention to arrangement, and by rejecting hypothetical reaſoning, a very few pages would be ſufficient to contain a valuable collection of the facts aſcertained with regard to the ſimple bodies, and the generic characters of compound, which would enable us to explain the properties of the ſpecies employed in medicine with more facility to ourſelves, and with greater advantage to our readers. Long after this part was ready for the preſs, Mr. DAVY's *Syllabus* was publiſhed, and we were agreeably flattered to find, that beſides the ſame general arrangement, we had often taken the ſame view of the ſame ſubjects. This ſimilarity enabled us on ſeveral occaſions to profit by Mr. DAVY's Syllabus during the printing of the ſheets.

The principal addition to the ſecond and third parts of this work, is the introduction of a complete tranſlation of the excellent Pharmacopœia of the Dublin College, which has never, we believe, appeared before in the Engliſh language. We therefore truſt, that it will be found an important and valuable addition. In Ireland, in particular, it muſt give the *Edinburgh New Diſpenſatory* an intereſt which it did not formerly poſſeſs.

The *ſecond part* contains the *Materia Medica*, arranged in alphabetical order. The alterations in this part are alſo very conſiderable. We have adopted the Nomenclature of the Edinburgh College, or rather of Natural Hiſtory, in preference to the officinal names hitherto employed. To the ſyſtematic name of each article, are ſubjoined its ſynonymes in the different Pharmacopœias, and the deſignations of the parts uſed in medicine; then the claſs and order of natural bodies to which it belongs, and if a vegetable, the exact number of its genus and ſpecies, according to the excellent edition of LINNÆUS's *Species Plantarum*, now publiſhing at Berlin by Profeſſor WILLDENOW.

The ancient practice of naming medicines from their inventors, or ſuppoſed virtues, has been for ſome time exploded from our Pharmacopœias; but it has been long cuſtomary to deſcribe both ſimple ſubſtances and their preparations or compoſitions by what are generally termed Officinal Names, in contradiſtinction to the preſent ſyſtematic names of the ſame ſubſtances. But their officinal names are in fact the old ſyſtematic names, which were unaccountably retained for the denomination of medicinal ſubſtances, after the improvements in Natural Hiſtory and Chemiſtry rendered the introduction of a new nomenclature into theſe ſciences neceſſary.

Attempts have been made, both in this country and in Germany, to introduce the language of Chemiſtry into Pharmacy; but theſe attempts, however uſeful, were but feeble and incomplete. The honour of being the firſt to compoſe a Pharmacopœia in the pure and unmixed language of Science, belongs indiſputably to the Royal College of Phyſicians of Edinburgh, in the beginning of the nineteenth century. It is extremely probable that to this innovation many objections may be made; but it is probable that they will rather apply to the neceſſary imperfections of a firſt attempt, than to the principle itſelf, the propriety of which can ſcarcely be doubted, when we conſider, that Materia Medica and Pharmacy are but an application of Natural Hiſtory and Chemiſtry to a particular purpoſe. If the general principle be admitted, it naturally follows, that the names of all Subſtances employed in Medicine, ſhould be the ſame with the names of the ſame ſubſtances, according to the moſt approved ſyſtems of Natural Hiſtory and Chemiſtry, and that the titles of Compound Bodies ſhould expreſs as accurately as poſſible the nature of their compoſition.

Conſiderable difficulties, however, occur, in attempting to form a nomenclature in ſtrict conformity with theſe principles. The moſt apparent of theſe is, that the titles of the more compounded medicines would become too verboſe and inconvenient, if they were to expreſs every ingredient, although of little importance. The College, fully aware of this difficulty, have therefore contented themſelves with indicating in the titles the principal ingredients only, on which their powers and uſes ſeem to depend. For the ſame reaſon, they have preſcribed ſome well-known ſimples in very frequent uſe, by their common names, ſuch as *Opium*, *Moſchus*, *Caſtoreum*, *Crocus Anglicus*, thinking it ſufficient to have pointed out in the catalogue of the Materia Medica the animals and vegetables from which they are obtained.

In moſt caſes it is proper to mention both the Generic and Specific names of ſimples; but where it is neceſſary to point out even the Variety employed, it will be in general more convenient to omit the ſpecific name, and to retain thoſe of the genus and variety, as *Aloës Socotorina* for *Aloës perfoliata Socotorina*, *Crocus Anglicus* for *Crocus ſativis Anglicus*. Alſo when any ſubſtance is obtained indiſcriminately from ſeveral ſpecies of the ſame genus, the ſpecific name may be omitted with propriety. Thus, it is ſufficient to ſay, *Reſina pini*, *Oleum volatile pini*, &c.

Another difficulty ariſes from the Reformers of Chemical Nomenclature not having pointed out the manner of expreſſing certain, and theſe very common, forms of combination, without employing a periphraſis totally incompatible with the brevity of a name. Pharmaceutiſts have therefore been obliged to ſupply this deficiency from their own ſtore.

The Edinburgh College have accordingly retained ſome titles, ſuch as *Tincture* and *Spirit*, which, although not ſtrictly chemical, have been long received in Pharmacy, and are ſo well underſtood and defined that they can lead to no error or ambiguity.

The principles, therefore, upon which the Edinburgh College have eſtabliſhed the new nomenclature which they have introduced into Materia Medica and Pharmacy, appear to be ſo rational and ſcientific, that it can ſcarcely fail to be generally adopted. As ſcience advances, its imperfections will be remedied, and its deficiencies ſupplied ; for, beſides other advantages, it facilitates re-remarkably the application of diſcoveries and improvements in Natural Hiſtory and Chemiſtry, to the purpoſes of medicine.

In other particulars, conſiderable additions have been made to the Natural Hiſtory of the different articles, to the means of diſtinguiſhing them from other ſubſtances with which they are apt to be confounded, and of detecting frauds and adulterations. Almoſt every thing which regards their Chemiſtry is entirely new. As from the principal liſt every article has been excluded which is not contained in the Materia Medica of at leaſt one of the Britiſh Colleges, we have given in an Appendix a very conciſe account of ſuch other articles as poſſeſs a place in ſome reſpectable foreign Pharmacopœias. We have alſo added liſts of the Medicinal Simples, arranged according to the beſt ſyſtems of Natural Hiſtory.

The *third part* contains the *Preparations and Compoſitions.*

In our general arrangement of theſe, we have not followed any of the Colleges exactly, although we have not deviated much from that of the Dublin Pharmacopœia. It is not of very great importance in what order the claſſes or chapters be arranged ; but theſe claſſes ſhould be natural, and, if poſſible, eſtabliſhed on one general principle. Unfortunately, however, in moſt Pharmacopœias, ſome of the claſſes are founded on Chemical Analogy, and others on the ſimilarity of form, or mode of preparation ; and what is ſtill worſe, ſome are entirely anomalous and unnatural. The laſt error we have carefully endeavoured to avoid, but we have not attempted, and, indeed, it ſeems ſcarcely poſſible, to form an uſeful arrangement, on a ſingle principle. The analogous preparations in the different Pharmacopœias, are always placed immediately next each other, which renders it eaſy to compare them, and to diſcover at once the circumſtances in which they reſemble or differ from each other.

The Commentaries upon this part, are more or leſs full, as the ſubject ſeemed to be more or leſs important. There was little opportunity for improvements in the obſervations upon their medical powers, becauſe theſe were generally the reſult of much practical experience, becauſe our plan confined us to the ſimple ſtatement of facts, and becauſe this Diſpenſatory is to be conſidered rather as a pharmaceutical than a practical expoſition of the Britiſh Pharmacopœias. It muſt not, however, be ſuppoſed that theſe have been neglected. Every part of them has been carefully examined; what had become obſolete, or unintereſting, has been rejected; whatever later experience has proved to be erroneous, has been corrected; and the diſcoveries made ſince the edition of 1789 have been added. At one time it was alſo intended to have inſerted examples of extemporaneous preſcription, with obſervations; but it would have extended the work too much beyond its uſual limits; and fortunately the deficiency is well ſupplied by the Theſaurus Medicaminum.

During the progreſs of this publication, all the beſt journals and ſyſtems of Chemiſtry particularly FOURCROY's *Syſtéme des Connaiſſances Chimiques*, have been occaſionally conſulted, for chemical information. But we lie under more immediate obligations to ſome of the German writers on Pharmacy, ſuch as HAGEN, HERMBSTAEDT, GÖTTLING, GREN, and WESTRUMB.

* * *

A FEW months only elapſed after the publication of the former edition of this Work, until a very large impreſſion was exhauſted, and it became again neceſſary to put it to the preſs. The ſhort interval has not allowed the Editor to make all thoſe alterations and improvements which he had projected; but every part of the work has been reviſed with care, and, although he is perfectly ſenſible that many errors have yet eſcaped him, which ought to have been avoided, yet he truſts that they are very few when compared to the maſs of facts crowded into one volume. The principal alterations and additions which have been made, conſiſt in the characters which ſalts derive from their baſes in the Epitome of Chemiſtry; the account of the general properties of common and mineral waters, charcoal, and a few other articles, in the Materia Medica, with a ſhort notice of every article contained in the Pharmacopœia-Boruſſica, Formulario Pharmaceutico of the hoſpital of Genoa; Marrabelii's Apparatus medicaminum, Van Mons's Pharmacopœia, and that of La Grange, which had not been previouſly mentioned; a liſt of the Genera of Medical Plants, according to the natural ſyſtem of Juſſieu, as improved by Ventenat, while the natural orders of Murray are retained, in the Materia Medica; and a Poſological and Proſodial Table, which cannot fail to be acceptable; beſides the introduction of every Pharmaceutical improvement which has come to the Author's knowledge during the interval which has elapſed between the publication of the two editions.

Edinburgh, *1ſt Oct.* 1804.

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128	14	*2d word,* Sulphate	Sulphite
—	24	*dele* 65	
145	2	*before* Scam.	*insert* Pil.
197	30	*for* Choræa	*read* chorea
230	39	corticæ	cortice
233	7	Aeurgo	Aerugo
245	15	ferro	ferri
297	8	Common	Corn
358	4	lime	zinc
359	19	Bataviæ	Brixiæ

Page	line		
433	31	*for* Ammonia	*r.* Ammoniæ
459	6	Pulv.	Pil.
474	4	Limitura	Limatura
480	2	Ammonæ	Ammoniæ
541	38	ſcill	ſuill
573	34	Mulberry	Raſpberry
583	23	*before* Emulſio	*inſ.* Emulſio Gummi MimoſæNiloticæ vulgo
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THE EDINBURGH

NEW DISPENSATORY.

PART I.

ELEMENTS OF PHARMACY.

1. THE object of Pharmacy is to provide thoſe ſubſtances which may be employed for the prevention or cure of diſeaſes.

2. To obtain this object completely, an acquaintance with the phyſical and chemical properties of bodies is neceſſary. This may be termed the Science of Pharmacy.

3. As few ſubſtances are found in nature in a ſtate fit for their exhibition in medicine, they previouſly undergo various preparations. Theſe conſtitute the Art of Pharmacy.

4. Pharmacy is ſo intimately connected with chemiſtry, that the former can neither be underſtood as a ſcience, nor practiſed with advantage as an art, without a conſtant reference to the principles of the latter. For this reaſon, it will be proper to premiſe ſuch a view of the general doctrines of chemiſtry, and of the moſt remarkable properties of chemical agents, as is neceſſary for the purpoſes of pharmacy.

SECT. I.

EPITOME OF CHEMISTRY.

5. Matter is extended and diviſible.

6. The moſt minute particles into which bodies can ultimately be divided are called their *Elementary particles*.

7. The moſt minute particles into which any ſubſtance can be divided, ſimilar to each other, and to the ſubſtance of which they are parts, are termed its *Integrant particles*.

8. When the integrant particles admit of no further diviſion, the body is a *ſimple ſubſtance.*

9. But the integrant particles of moſt bodies can be ſubdivided into other particles, differing in their nature from each other, and from the body of which they are parts. Theſe bodies are called *Compound bodies.*

10. If the particles, of which the integrant particles of any compound body are compoſed,
   - *a.* admit of no further diviſion, the body is a *primary compound;*
   - *b.* but if they be alſo compound, and admit of ſtill further ſubdiviſion, they are called *Intermediate particles,* and the body is a *ſecondary compound.*

11. Therefore the integrant particles
   - *a.* of ſimple ſubſtances are alſo their elementary particles;
   - *b.* of primary compounds are compoſed of elementary particles;
   - *c.* of ſecondary compounds are compoſed of intermediate particles.

12. The phenomena of matter are regulated by attraction and repulſion.

Attraction.

13. Attraction comprehends thoſe forces which cauſe bodies to approach towards each other.

14. It operates
   - *a.* at ſenſible diſtances, as in the attractions of gravity, electricity, and magnetiſm;
   - *b.* at inſenſible diſtances;
      - *a a.* between particles of the ſame ſpecies, conſtituting the attraction of coheſion or aggregation;
      - *b b.* between particles of different ſpecies, the attraction of compoſition or affinity.

Repulsion.

15. Repulſion tends to ſeparate bodies from each other.

16. It alſo operates either
   - *a.* at ſenſible diſtances, as in the repulſion of electricity and magnetiſm; or,
   - *b.* at inſenſible diſtances, as in the repulſion of the matter of heat or caloric.

17. The phenomena reſulting from the operation of the ſecond claſs of attractions, (14. *b.*) and ſecond claſs of repulſions, (15. *b.*) conſtitute the proper objects of chemiſtry.

AGGREGATION.

18. Bodies exiſt under different forms of aggregation:
    - *a.* Solid, in which the attraction of coheſion reſiſts relative motion among the particles, either
        - *a a.* perfectly, as in hard bodies; or
        - *b b.* imperfectly, as in ſoft, malleable, ductile, and elaſtic bodies.
    - *b.* Fluid, in which it admits relative motion among the particles, either with facility, as in perfect fluids; or difficultly, as in viſcid fluids.
    - *c.* Gaſeous, in which the particles repel each other.

AFFINITY.

19. Affinity is regulated by the following laws:
    - *a.* It does not act at ſenſible diſtances.
    - *b.* It is exerted only between particles of different ſpecies.
    - *c.* It is exerted by different bodies, with different degrees of force.
    - *d.* Moſt bodies combine only in certain proportions.
    - *e.* It is the inverſe *ratio* of ſaturation.
    - *f.* It increaſes with the maſs.
    - *g.* Its action is influenced by coheſion and elaſticity.
    - *h.* It is often accompanied by a change of temperature.
    - *i.* Subſtances, chemically combined, acquire new properties;
    - *k.* And cannot be ſeparated by mechanical means.
20. Affinity is
    - *a.* ſimple, when two bodies unite, in conſequence of their mutual attraction alone, whether theſe bodies be themſelves ſimple or compound, and even although in the latter caſe, it be attended with decompoſition.
    - *b.* compound, when there is more than one new combination, and when the new arrangement would not have taken place, in conſequence of the attractions tending to produce either combination ſingly.
    - *c.* diſpoſing, when bodies, which apparently have no tendency to unite, combine, in conſequence of the addition of another body, which has a ſtrong affinity for the compound.

When the ſcience of chemiſtry comes to be better underſtood, all the caſes at preſent referred to this laſt ſpecies of affinity, will probably be found to belong to one of the preceding ſpecies: for, it is abſurd to ſuppoſe, that a body can poſſeſs affinities before it is formed.

21. The attractions which tend to preſerve the original arrangement of bodies preſented to each other, are denominated Quieſcent attractions; thoſe which tend to deſtroy the original, and to form a new arrangement, are termed Divellent attractions.

22. It is evident, that no new arrangement can take place, unleſs the divellent be more powerful than the quieſcent attractions.

Claſſification of SIMPLE *or* ELEMENTARY SUBSTANCES.

23. Simple ſubſtances:

A. Without appretiable gravity,	Light.
	Caloric.
	Electricity.
	Galvaniſm.
	Magnetiſm.
B. Gravitating ſubſtances:	
a. Capable of ſupporting combuſtion,	Oxygen.
b. Oxygenizable,	Hydrogen.
1. Incombuſtible,	Nitrogen.
	Muriatic acid.
2. Combuſtible,	Carbon.
	Sulphur.
	Phoſphorus.
	Metals.
c. Having no affinity for oxygen,	Earths.
	Potaſs and ſoda.
	Fluoric and Boracic acids.

Although, from their not having been yet decompounded, the muriatic, fluoric, and boracic acids, are enumerated here, their properties are detailed under the head of acids; for there is every analogical reaſon for believing them to be compounds.

24. In treating of theſe ſubſtances, I ſhall begin with the firſt claſs, on account of the very great influence of caloric on all chemical actions: but, of the ſecond claſs, I ſhall firſt conſider the laſt order, becauſe they are tangible objects, conſiderably permanent in their properties, and ſimple in their action; and becauſe the reader will thus become gradually familiarized with chemical language, before entering upon the conſideration of ſubſtances, whoſe properties are ſcarcely the objects of our ſenſes, and which are highly alterable in their nature, and complicated in their action.

25. Compound bodies may be divided into

a. primary compounds (10 *a.*) conſiſting of ſimple ſubſtances, combined with each other. Theſe may be ſubdivided into binary, ternary, quaternary, &c. according to the number of their conſtituents.

b. ſecondary compounds (10 *b.*) conſiſting of compound bodies combined with ſimple bodies, or with each other.

26. This diviſion is entirely arbitrary, as we are in fact ignorant of what are really ſimple bodies, and cannot aſcertain the manner of combination in bodies compounded of three or more elements. The diviſion, however is convenient.

27. As the chemical nature of bodies is determined by their action on each other, and as, in every caſe, we ſhould endeavour to advance from what is known, to what is not known, the ſimple ſubſtances will firſt be deſcribed, and then ſuch of the primary compounds which they form with ſubſtances already treated of as are not more conveniently arranged in ſeparate claſſes.

LIGHT.

28. Light emanates in every direction from viſible bodies.

29. It moves in ſtraight lines, with a velocity equal to 200,000 miles in a ſecond.

30. Its gravity is not appretiable.

31. When a ray of light paſſes very near a ſolid body, it is inflected towards it.

32. When it paſſes at a diſtance ſomewhat greater, it is deflected from it.

33. When a ray of light falls upon a poliſhed ſurface, it is reflected from it, and the angle of reflection is equal to the angle of incidence.

34. Bodies which do not allow light to paſs through them are termed Opaque.

35. Bodies which allow it to paſs freely through them are termed Tranſparent.

36. When a ray of light paſſes obliquely from one medium into another of greater denſity, it is bent towards the perpendicular; but if the ſecond medium be of leſs denſity, it is bent from the perpendicular. The light, in both caſes, is ſaid to be Refracted.

37. The refracting power of bodies is proportional to their denſities, except with regard to inflammable bodies, of which the refracting power is greater than in proportion to their denſities.

38. By means of a triangular priſm, light is ſeparated by refraction into ſeven rays; red, orange, yellow, green, blue, indigo, and violet.

39. Theſe rays are permanent, and ſuffer no further change by reflection or refraction.

40. They differ in flexibiliy and refrangibility; the red poſſeſſing theſe properties in a leſs degree than the orange, the orange than the yellow, and ſo on in the order of their enumeration.

41. They poſſeſs different powers of illumination. It is greateſt between the yellow and green, and gradually declines towards both ends of the ſpectrum.

42. The different colours of bodies depend on their tranſmitting or reflecting thoſe rays only which conſtitute their particular colours.

43. White conſiſts of the whole priſmatic rays united.

44. Black is the total abſence of light, or complete ſuffocation of all the rays.

45. The ſun's rays poſſeſs the power of heating bodies.

46. The heating power of the different rays is inverſely as their refrangibility. But as this power is greateſt at ſome diſtance beyond the red end of the viſible ſpectrum, it is probable that it is totally independent of the colorific rays.

47. Bodies are heated by light inverſely as their tranſparency, and directly, as the number of rays ſuffocated by them.

48. The ſun's rays poſſeſs the chemical property of ſeparating oxygen from many of its combinations.

49. The diſoxygenizing power of the different rays is in proportion to their refrangibility. But as this power is greateſt at a ſmall diſtance beyond the violet end of the viſible ſpectrum, it is probable that it is totally independent of the colorific or calorific rays.

50. Light is abſorbed by many bodies, and again emitted by them in the dark.

51. The ſources of light are the ſun's rays, combuſtion, heat, and percuſſion.

52. Light is ſuppoſed by many to exiſt in a latent ſtate in all combuſtible bodies.

CALORIC.

53. Heat, in common language, is a term employed to expreſs both a certain ſenſation, and the cauſe producing that ſenſation. In philoſophical language, it is now confined to the ſenſation, and the term Caloric has been ſubſtituted to expreſs the cauſe.

54. Temperature is that ſtate of any body, by which it excites the ſenſation of heat or of cold, and produces the other effects which depend on the exceſs or deficiency of caloric.

55. The moſt general effect of caloric is expanſion; the only real exception to this law being the contraction of water from the loweſt temperature at which it can remain fluid, to 42.5° F. This expanſion either conſiſts,

a. in a ſimple increaſe of volume; or

b. it produces a change of form in the ſubſtance heated.

56. The former ſpecies takes place gradually, and at all tem-

peratures, as long as the bodies expanded undergo no other change.

57. Bodies differ very much in the degree of expanſion which equal increments of temperature produce in them. Gaſes are more expanſible than fluids, fluids than ſolids. The individuals of each form of aggregation alſo exhibit conſiderable differences.

58. The ſecond ſpecies occurs ſuddenly, and always at certain degrees of temperature.

59. The degree at which any ſolid is rendered fluid by means of caloric, is denominated its point of fuſion; and that at which either a ſolid or a fluid is converted into vapour, is its boiling point, or point of vaporization. Vaporization is much retarded by increaſe of preſſure, and facilitated by its diminution, inſomuch, that thoſe ſubſtances which, under the ordinary preſſure of the atmoſphere, ſeem to paſs at once from the ſtate of ſolid to that of vapour, may, by the application of ſufficient preſſure, be made to aſſume the intermediate ſtate of fluidity; while, on the contrary, all fluids which have been hitherto tried, begin in a vacuum to boil and omit vapour, when their temperature is lower by 120° at leaſt than their vaporific point, at the ordinary preſſure of the atmoſphere.

60. From analogy, all bodies are conſidered as ſolid, when totally deprived of caloric; but they are termed ſolid, fluid, or gaſeous (18.), according to the ſtate in which they exiſt at the ordinary temperature of the atmoſphere. They are alſo termed fuſible, or infuſible, volatile, or fixed, condenſible, or permanently elaſtic, according to the effects of caloric upon them.

61. Another very general effect of caloric, is increaſe of temperature.

- *a.* This effect is conſtant when bodies retain their form of aggregation, or undergo the gradual ſpecies of expanſion (55. *a.*);
- *b.* but while they undergo the ſudden ſpecies (55. *b.*) they remain at one determinate temperature, that neceſſary for their fuſion or vaporization, until the change be completed throughout the whole.

62. During the time neceſſary to effect this, the influx of caloric continues as before, and as it does not increaſe the temperature, it is ſaid to become latent or combined.

63. The caloric neceſſary for theſe changes (61. *b.*) is beſt denominated the caloric of fluidity, and the caloric of vaporization; and its quantity, is determinate with regard to each ſubſtance.

64. The abſolute caloric, or total quantity of caloric contained in any body, is perfectly unknown; but the quantity which increaſes the temperature of any body a certain number of degrees, si termed its Specific caloric; (capacity for caloric, of Black, Craw-

ford, and others), when its weight is the object of compariſon ; and by Dr. Thomſon, its Capacity for caloric, when its volume is conſidered. The ſpecific, and therefore the abſolute, caloric of bodies, varies very much.

65. Incandeſcence is the leaſt general effect of caloric, as it is confined to thoſe ſubſtances which are capable of ſupporting the very high temperature neceſſary for its production, without being converted into vapour or gas.

66. On the living body caloric produces the ſenſation of heat, and its general action is ſtimulant. Vegetation and animal life are intimately connected with temperature, each climate ſupporting animals and vegetables peculiar to itſelf.

67. Caloric influences affinity, both on account of the operation of its own affinities, and of its facilitating the action of bodies, by counteracting coheſion (18.) For the latter reaſon, it alſo promotes ſolution, and increaſes the power of ſolvents.

68. The particles of caloric repel each other : it is therefore diſpoſed to fly off in every direction from a body in which it is accumulated, or to paſs off by radiation.

69. Caloric is attracted by all other bodies.

70. Radiated caloric is tranſmitted with the velocity of light ; and, like it, it is reflected and refracted.

71. It has therefore an irreſiſtible tendency ſo to diſtribute itſelf as to produce an univerſal equilibrium of temperature, or to paſs from bodies in which it is accumulated, into bodies in which it is deficient, until the attraction of each for caloric, and the repulſive force (67) of the caloric contained in each become equal to each other.

72. But the paſſage of caloric through moſt bodies is immenſely impeded by ſome unknown cauſe.

73. When caloric moves through bodies with this diminiſhed velocity, it is ſaid to be conducted by them. Mètals are the beſt conductors ; then ſtones, glaſs, dried wood. Spongy bodies, in general, are bad conductors. Fluids alſo conduct caloric ; but as they admit of inteſtine motion among their particles, they carry it more frequently than they conduct it.

74. If affinity for caloric has any influence on the conducting power of bodies, it muſt increaſe it, or their conducting power muſt be directly as their affinity for caloric.

75. The general effects of the abſtraction of caloric, are diminution of volume, condenſation, diminution of temperature, and ſenſation of cold. It alſo influences affinity, and, in general, retards ſolution. The abſtraction of caloric never can be total ; and the attempts to calculate the thermometrical point at which it would take place, although ingenious, are not ſatisfactory. Thoſe moſt worthy of confidence place it about —1500° F.

76. The means employed to increaſe temperature are, the rays of the ſun, collected by means of a concave mirror, or double convex lens, electricity, friction, percuſſion, colliſion, condenſation, and combuſtion. Temperature is diminiſhed by rarefaction, evaporation, and liquefaction.

77. Temperature is eſtimated relatively by our ſenſations, and abſolutely by means of various inſtruments. The thermometer indicates temperature by the expanſion which a certain bulk of fluid undergoes from the addition of caloric, and by the condenſation produced by its abſtraction. Mercury, from the uniformity of its expanſion, forms the moſt accurate thermometer; but for temperatures in which mercury would freeze, alcohol muſt be employed. Air is ſometimes uſed to ſhew very ſmall variations of temperature. The pyrometer of Wedgewood, which is employed for meaſuring very high temperatures, depends upon the permanent and uniform contraction of pure clay at theſe temperatures.

ELECTRICITY.

78. The particles of the electric fluid repel each other, with a force decreaſing as the diſtances increaſe.

79. They attract the particles of other bodies, with a force decreaſing as the diſtances increaſe; and this attraction is mutual.

80. They are diſperſed in the pores of other bodies, and move with various degrees of facility through different kinds of matter.

- *a.* Bodies, through which they move without any perceivable obſtruction, are called Non-electrics.
- *b.* Bodies, through which they move with very great difficulty, are called Electrics.

81. The phenomena of electricity ariſe

- *a.* from the actual motion of the fluid from a body containing more into another body containing leſs of it;
- *b.* from its attraction or repulſion, independently of any tranſference of fluid.

82. By rubbing electrics on each other, the diſtribution of the electric fluid in them is altered. On ſeparating them, the one contains more, and the other leſs, than the natural quantity; or, the one becomes poſitively, and the other negatively, electrified.

83. Electrics may alſo be excited by rubbing them with non-electrics.

84. If a body B be brought into the neighbourhood of an electrified body A, B becomes electrified by poſition.

85. If a body B be inſulated, that is in contact with electrics only, when brought into the neighbourhood of an electrified body A, a ſpark paſſes between them, accompanied by noiſe. B be-

comes permanently electrified, and the electricity of A is diminiſhed.

86. When a body A has imparted electricity to another body B, they repel each other, unleſs B ſhall have afterwards imparted all its electricity to other bodies.

87. Bodies repel each other when both are poſitively or both negatively electrified

88. Bodies attract each other, when the one is poſitively and the other negatively electrified.

89. If either of the bodies be in the natural ſtate, they will neither attract nor repel each other.

90. The ſpark (84.) is accompanied by intenſe increaſe of temperature (75.), and will kindle inflammable bodies.

91. It produces very remarkable chemical effects, depending chiefly on ſudden and momentary increaſe of temperature, and on the light produced.

92. Electricity acts on the living ſyſtem as a ſtimulus.

GALVANISM.

93. The phenomena of galvaniſm ſeem to depend ſolely on the agency of electricity, excited during certain chemical actions.

94. The galvanic fluid is excited by arranging at leaſt three heterogeneous bodies; for inſtance, two metals and a fluid, in ſuch a manner that the two metals be in direct contact with each other, in one part, and have the fluid interpoſed between them in another.

95. The pile of Volta, by which it is rendered moſt manifeſt, is conſtructed, by combining a ſeries of ſimple galvanic arcs (93.) into one continuous circle, in one uniform order of arrangement.

96. The ſolids capable of exciting galvaniſm, are the metals and charcoal; and the moſt efficient fluids are certain ſaline ſolutions.

97. The effects of the ſimple galvanic circle (93.) on the animal body, are the production of a ſenſation of light when applied to the eye; of an acid taſte on the tongue; and the excitement of the muſcles through the medium of the nerves.

98. The pile, when well conſtructed, beſides theſe effects, alſo gives a ſhock and ſpark reſembling thoſe of electricity (84.), and proves, that the galvanic action is always accompanied by the decompoſition of the fluid, and a combination of one of its conſtituents with one of the metals.

MAGNETISM.

99. If an oblong piece of iron be ſuſpended freely, it will aſſume a determinate poſition with regard to the axis of the earth.

100. When the ſame end always points in the ſame direction, it is ſaid to poſſeſs polarity, or to be a magnet.

101. The ſimilar poles of two magnets repel each other; and the diſſimilar poles attract each other with a force decreaſing as the diſtances increaſe.

102. Any piece of iron, when in the neighbourhood of a magnet, is a magnet; and its polarity is ſo diſpoſed, that the magnet and iron mutually attract each other.

103. Magnetiſm does not ſeem to affect ſenſibility or irritability, or to influence chemical action.

SALIFIABLE BASES.

104. The great bulk of this globe conſiſts of earths and ſtones. Although theſe vary infinitely in their external character and phyſical properties, they are found to conſiſt of a very few ſubſtances, mixed together in different proportions, and modified by external agents.

105. Theſe elementary ſubſtances are termed Earths. Their general characters are, total want of inflammability, infuſibility, fixedneſs, a ſpecific gravity leſs than 5, inalterability, whiteneſs, dryneſs, brittleneſs, ſparing ſolubility in water, and, in general, inſipidity and want of ſmell, capability of forming chemical compounds with acids, alkalies, ſulphur, phoſphorus, and oils, and fuſibility when mixed with each other, or with alkalies, into colourleſs glaſſes, enamels, or porcelains.

106. Alkalies are a claſs of bodies which are commonly defined to be incombuſtible, ſoluble in water, cauſtic, and capable of neutralizing the acids, of combining with alcohol, oils, earths, ſulphur, and phoſphurus, and of changing vegetable blues and reds to green: But as many of theſe properties are poſſeſſed in a greater or leſs degree by ſubſtances uſually claſſed with the earths, and as there is a continual gradation from the inſipidity, inſolubility, and infuſibility of ſilica, to the cauſticity, ſolubility, fuſibility, and comparative volatility of potaſs, they are ſometimes claſſed together under the general name of Salifiable Baſes.

EARTHS.

107. *Silica*, when obtained perfectly pure by art, is in the form of a very fine powder, hard, rough, and gritty, to the touch; when applied to the tongue, giving a rough and dry ſenſation, but without taſte or ſmell, having a ſpecific gravity of 2.66; when completely diſaggregated, ſoluble in 1000 times its weight of water; ſoluble in the fixed alkalies and fluoric acid; fuſible with the fixed alkalies and other earths; and combining by fuſion with the metallic

oxides, and the phoſphoric and boracic acids. It has a tendency to cryſtallization, and its ultimate particles ſeem to be tranſparent. It in general imparts to the foſſils of which it is a principal conſtituent, tranſparency, luſtre, a tendency to cryſtallization, and a degree of hardneſs, enabling them to ſtrike fire with ſteel. Rock-cryſtal, quartz, agate, flint, calcedony, jaſper, ſhorl, are examples of ſiliceous ſtones.

108. *Zirconia* is obtained in the form of a fine white powder, almoſt ſoft to the touch; without taſte or ſmell; having, in a ſtate of aggregation, a ſpecific gravity of 4.3; inſoluble in water; infuſible by heat alone, but, when ſurrounded by charcoal, its particles become agglutinated, and ſo hard as to ſtrike fire with ſteel; ſoluble in all the acids; fuſible with ſilex and alumina; inſoluble in the alkalies, but ſoluble in their carbonates. It is only found in the zircon or jargon of Ceylon, and in different varieties of hyacinth.

109. *Alumina* is obtained in friable fragments, or in a very fine white powder; ſoft and unctuous to the touch; adhering ſtrongly to the tongue, abſorbing its moiſture, and producing a ſlight ſtyptic effect upon it; ſpecific gravity, 2; inſoluble in water, but very diffuſible through it; abſorbing a certain quantity of it rapidly, and forming with it a very ductile adheſive paſte, which contracts and hardens remarkably in the fire, but is perfectly infuſible. Its ultimate particles ſeem to be opaque. It combines with moſt of the acids, and theſe compounds have a ſweetiſh ſtyptic taſte; it unites with charcoal, the alkalies, baryta, ſtrontia, lime, and ſilica; it is manufactured into porcelain and glaſs. Foſſils, containing much alumina, have generally a laminated ſtructure; it exiſts cryſtallized in ſapphire; and it forms the baſis of all clays, boles, mica, trap, baſaltes, ſlate, and corundum.

110. *Yttria* (Gadolina) is obtained in the form of a fine white powder, without taſte or ſmell; inſoluble in water; it does not alter vegetable blues; is infuſible; inſoluble in the alkalies, but readily ſoluble in the carbonate of ammonia. With the acids it forms ſalts, which have a ſweet and ſomewhat auſtere taſte. It has been found only in the gadolinite.

111. *Glucina* is obtained in white light maſſes or powder, of a ſoft feel, inſipid, but adhering ſtrongly to the tongue; apyrous and inſoluble in water, but forming with it a paſte, ſlightly ductile and adheſive; it is ſoluble in potaſs, ſoda, and carbonate of ammonia; it combines with moſt of the acids, forming ſoluble ſalts, difficultly cryſtallizable, of a ſweet and ſomewhat aſtringent taſte, and with ſulphuretted hydrogen. It has hitherto been found, very ſparingly, only in the beryl and emerald.

112. *Magneſia* is obtained in light white friable maſſes, or very fine powder; to the touch it is very fine; its taſte is not very ſen-

ſible, but peculiar and pleaſant; its ſpecific gravity is 2.33. It is inſoluble in water, but forms with it a paſte without ductility. It is apyrous; ſlightly alters vegetable blues to green; forms ſoluble compounds with moſt acids, and unites with ſulphur. The foſſils, in which it predominates, are generally ſoft, and have an unctuous feel; the principal are talc, ſteatites, aſbeſtos, &c. *Officinal.*

113. *Lime* is obtained in the form of a grey ſtone, or in fragments more or leſs pulverulent and white; warm, acrid, and urinous to the taſte; reddening the ſkin when applied to it for any time; ſpecific gravity 2.33. It is ſoluble in 450 times its weight of water, and has a ſtrong attraction for it. If a certain quantity of water be thrown upon freſh burnt lime, it is abſorbed rapidly, with the extrication of conſiderable heat, and ſome phoſphoreſcent light; at the ſame time the lime crumbles down into a very fine, white, dry powder, augmented much in bulk, but leſs cauſtic than before. Lime, thus ſlaked, does not renew theſe phenomena, on a further addition of water, but may be diffuſed or diſſolved in it. It is apyrous; it changes vegetable blues to green; it combines with all the acids, ſulphur, ſulphuretted hydrogen, and phoſphorus; it is very abundant in the mineral kingdom, and forms the baſes of animal bones and ſhells. The calcareous ſpars, marble, limeſtone, chalk, and marl, conſiſt chiefly of lime. *Officinal.*

114. *Strontia* is obtained in ſmall, whitiſh grey, and often porous maſſes; its taſte is warm, acrid, and urinous; it is ſlightly cauſtic, acting feebly on animal matters. Taken into the ſtomach, it is not poiſonous; its ſpecific gravity is nearly 4.; it is ſoluble in 200 times its weight of water at 50°, but in little more than ſix times its weight of boiling water, which, on cooling, depoſits flat rhomboidal cryſtals; it is ſlaked more rapidly than lime, and it is infuſible; it changes vegetable blues to green; it combines with all the acids, ſulphur, ſulphuretted hydrogen, and phoſphorus, alumina, and ſilex. It is the baſis of ſome of the heavy ſpars.

115. *Baryta* is obtained in ſmall, grey, porous maſſes, of tolerable ſolidity; its taſte is acrid, urinous, and pungent; applied to the ſkin, it proves cauſtic, and it is deleterious when ſwallowed; its ſpecific gravity is 4.; it is ſoluble in twenty times its weight of cold water, and in twice its weight of boiling water; depoſiting, on cooling, tranſparent, white, priſmatic cryſtals; when ſlaked, it boils up with violence, becomes very hot, increaſes in bulk, and is changed into a ſpongy white maſs. It changes vegetable blues to green; it is fuſible; it combines with all the acids, ſulphur, ſulphuretted hydrogen, and phoſphorus. It is the baſis of ſome of the heavy ſpars.

ALKALIES. (105.)

116. *Soda* is got in the form of ſolid plates, of a greyiſh-white

colour, urinous taſte, and burning cauſticity; acting with conſiderable violence on animal matter. When a certain quantity of water is thrown upon it, it abſorbs and ſolidifies it, with the diſengagement of caloric, and a lixivial ſmell; a larger quantity diſſolves it; it abſorbs from the atmoſphere moiſture and carbonic acid, becoming leſs cauſtic. In the fire it melts like an oily ſubſtance; boils, and is converted into vapour; but is incombuſtible: it is cryſtallizable into tranſparent priſmatic cryſtals. It changes vegetable blues to green; unites with all the acids, oils, ſulphur, ſulphuretted hydrogen, phoſphorus, many metallic oxides, and the earths. It forms the baſis of rock-ſalt and ſea-ſalt; is obtained from the aſhes of marine plants, and exiſts in ſome minerals.

117. *Potaſs* is a ſolid, white ſubſtance; extremely acrid to the taſte; unctuous to the feel, but highly cauſtic; deſtroying the ſkin, and diſſolving all ſoft animal ſubſtances. It is deliqueſcent and ſoluble in half its weight of water at 50° Fahrenheit; it is fuſible, and may be vaporized, but is perfectly incombuſtible; it is capable of cryſtallizing into very long quadrangular, compreſſed priſms, terminated by ſharp pyramids; it changes vegetable blues to green, and combines with all the acids, oils, ſulphur, ſulphuretted hydrogen, and the earths. It is obtained from the aſhes of vegetables, and exiſts in ſome minerals. *Officinal.*

118. *Ammonia* is always claſſed with the alkalies, from the analogy of its taſte, cauſticity, combinations with the acids, and effects upon vegetable blues; but as it differs in many particulars, being extremely volatile, and a compound ſubſtance, readily decompoſed, and formed in many chemical operations, and its compoſition well known, we have ventured to ſeparate it from the alkalies, and refer it to that place, which, in all probability, it will always retain, and to which the other alkalies will, perhaps, be referred, when their compoſition ſhall be detected. *Officinal.*

PRIMARY COMPOUNDS OF THE SALIFIABLE BASES.

A. With each other; earthen-ware; glaſs.
B. With ſulphur; alkaline and earthy ſulphurets.
C. With phoſphorus; alkaline and earthy phoſphurets.

119. The ſubſtances of this claſs exert a conſiderable action on each other. Potaſs was long believed to be the only ſolvent of ſilica; and it is now further proved, that the whole of this claſs are capable of combining, when preſented to each other in a ſtate of ſolution; and on this property, in part, the effect of mortars depends. Their action on each other, by means of heat, is of much greater importance, as it includes the theories of the manufactures of porcelain and glaſs.

120. Porcelain, and all kinds of earthen ware, conſiſt of alumina and ſilica, mixed in different proportions into a plaſtic maſs, fabri-

cated into various ſhapes, dried and expoſed to the heat of a furnace, where they undergo a kind of ſemifuſion. They are glazed by being thinly covered with a more fuſible compoſition, and may be afterwards painted with enamels, which are ſtill more fuſible than the glazing.

121. Glaſs is compoſed by melting about equal parts of potaſs or ſoda with ſilica. It is harder and more durable in proportion to the exceſs of the ſilica. The tranſparency of glaſs depends upon its being cooled quickly; for if cooled very ſlowly, it aſſumes a radiated cryſtalline appearance, and becomes perfectly opaque. By melting ſilica with about three times its weight of ſoda or potaſs, a glaſs is obtained, which not only is ſoluble in water, but even attracts moiſture from the atmoſphere. This ſolution has long been known by the name of Liquor of Flints. The property which metallic oxides have of rendering glaſſes more fuſible, and of imparting to them certain colours, has given riſe to the arts of imitating precious ſtones, and of enamelling.

OXYGEN.

122. *Oxygen* is the principle on which moſt of the chemical qualities of atmoſpheric air depend. Its tendency to combination is ſo very ſtrong, that it has never been procured in a ſeparate ſtate. Oxygen gas, or the combination of oxygen with caloric, is its moſt ſimple form. This is permanently elaſtic, compreſſible, tranſparent, indorous, and inſipid. Its ſpecific gravity is 0.00135. It ſupports inflammation; is neceſſary for reſpiration and vegetation, and is decompoſed in all theſe proceſſes; it conſtitutes 0.22 of atmoſpheric air. Oxygen is alſo a principal conſtituent in water, in all acids and metallic oxides, and in almoſt all animal and vegetable ſubſtances. It is ſeparated from many of its combinations by the ſun's rays, (48.)

OXYGENIZEMENT.

123. As the characteriſtic diſtinction between the ſimple ſubſtances already treated of, and thoſe which remain to be examined, conſiſts in the former poſſeſſing no affinity whatever for oxygen, and in the latter having a more or leſs ſtrong attraction for it, it will be proper to explain in this place, the general phenomena which attend the combination of oxygen with oxygenizable baſes. The term Combuſtion has been by the French chemiſts incorrectly extended to all theſe combinations; for in common language, that word is applied to caſes in which oxygen is not an agent, and always ſuppoſes the production of heat and light, although in numberleſs inſtances of oxygenizement theſe phenomena do not appear.

124. Oxygenizement is an example of chemical union, and is ſubjected to all the laws of affinity, (19). It requires the preſence and contact of oxygen, and of another ſubſtance poſſeſſing affinity for it.

125. Oxygenizable baſes attract oxygen with very different degrees of force. This attraction is much influenced by temperature. Thus charcoal, which at ordinary temperatures ſeems to poſſeſs no attraction for oxygen, unites with it rapidly, and almoſt inſeparably, when heated to ignition.

126. Oxygen combines with moſt oxygenizable ſubſtances in certain definite proportions, perhaps only in one, and the apparent variety of proportions may be owing to a ſecond or third ſimilar combination of the firſt compound with another quantity of oxygen, or of the baſe; and of the ſecond compound with a third quantity.

127. The attraction between oxygen and the oxygenizable baſes, is in the inverſe ratio of ſaturation; or, in other words, the affinity by which they form their primary combinations, is ſtronger than that by which they form any ſecondary combination, and ſo on progreſſively.

128. In many inſtances, oxygenizement is ſo ſtrongly oppoſed by coheſion, that it does not take place unleſs aſſiſted by a degree of heat ſufficient to melt or vaporize the oxygenizable baſe.

129. It is alſo often accompanied by the extrication of caloric and light in a very conſpicuous degree. To theſe the term combuſtion ſhould be confined; and only ſuch oxygenizable baſes as are capable of exhibiting theſe phenomena are combuſtible. Theſe phenomena depend upon the new compound, having a weaker affinity or leſs capacity than its conſtituents for light and caloric, which are therefore extricated.

130. If the combuſtible body be vaporized, flame is produced, and the proceſs is then denominated Inflammation.

131. By its union with oxygenizable ſubſtances, oxygen undergoes very various changes of its properties. In many inſtances, the compounds of oxygen are fluid or ſolid, opaque, coloured, incapable of ſupporting inflammation, and deleterious to animal or vegetable life. The changes which the oxygenizable baſes undergo, are no leſs conſpicuous. Their form, colour, taſte, odour, denſity, permeability to light and electricity, ſpecific caloric, and, finally, their affinities, are often totally altered.

132. When, in conſequence of oxygenizement, any ſubſtance acquires a ſour taſte, and the properties of converting vegetable blues to red, and of ſaturating or deſtroying the characteriſtic properties of alkalies and earths, it is ſaid to be acidified, and ſuch compounds are termed Acids.

133. When it does not acquire theſe properties, the compounds termed Oxides.

134. Many oxides are capable of being converted into acids, by combination with an additional quantity of oxygen.

135. Oxygen is capable of combining at the ſame time with two or more ſubſtances; and the oxides or acids which reſult from ſuch combinations, are termed Oxides or Acids with a double or triple baſe.

136. In general, the baſes which are leaſt ſimple, unite with oxygen in the greateſt variety of proportions.

PRIMARY COMPOUNDS of OXYGEN.

A. Binary,
  a. with nitrogen:
    1. Atmoſpheric air.
    2. Nitrous oxide.
    3. Nitric oxide.
    4. Nitric acid.
  b. With hydrogen: water.
  c. With carbon:
    1. Incombuſtible coal, plumbago.
    2. Charcoal, (carbonous oxide).
    3. Gaſeous oxide of carbon, (carbonic oxide).
    4. Carbonic acid.
  d. With ſulphur:
    1. Protoxide of ſulphur.
    2. Peroxide of ſulphur.
    3. Sulphureous acid.
    4. Sulphuric acid.
  e. With phoſphorus:
    1. Oxide of phoſphorus.
    2. Phoſphorus acid.
    3. Phoſphoric acid.
  f. With metals:
    1. Metallic oxides.
    2. Metallic acids.
B. Ternary,
  a. with carbon and hydrogen:
    1. Oxides. Hydro-carbonous oxides, alcohol, ether, oil, vegetable ſubſtances.
    2. Acids. Vegetable acids.
  b. with hydrogen and ſulphur:
    Sulphuretted hydrogen, hydroguretted ſulphur.

C. Quaternary, with hydrogen, carbon and nitrogen.
    1. Oxides. Animal ſubſtances.
    2. Acids. Animal acids.

NITROGEN, (Azote).

137. *Nitrogen*, or azotic, *gas* conſtitutes 0.78 of the atmoſphere. But as it has few attractions at ordinary temperatures, its principal effect on the chemical properties of the atmoſphere ſeems to be the dilution of the oxygen gas, which in its pure ſtate would be more active than is conſiſtent with the economy of nature. It alſo is permanently elaſtic, compreſſible, inodorous, and inſipid; it greens very delicate vegetable blues; its ſpecific gravity is 0.0012; it is unable to ſupport reſpiration, vegetation, or combuſtion, it is acidifiable, and is a conſtituent of the nitric and nitrous acids, nitrous and nitric oxides, of ammonia, and perhaps of the other alkalies, and of moſt animal ſubſtances; it diſſolves phoſphorus and carbon in ſmall quantities, and is not abſorbed by water.

PRIMARY COMPOUNDS of NITROGEN.

A. Binary,
    a. with oxygen:
        1. Atmoſpheric air.
        2. Nitrous oxide.
        3. Nitric oxide. (Nitrous gas.)
        4. Nitric acid.
    b. With hydrogen. Ammonia. (Nitroguret of Hydrogen.)
    c. With ſulphur. Sulphuretted nitrogen gas.
    d. With phoſphorus Phoſphuretted nitrogen gas.
B. Quaternary, with hydrogen, carbon and oxygen.
    a. Oxides. Animal ſubſtances.
    b. Acids. Animal acids.

138. *Atmoſpheric air* conſiſts of 22 parts of oxygen gas, and of 78 of azotic gas by bulk, or 24.33, and 75.67 by weight; it is tranſparent, compreſſible, and permanently elaſtic; its ſpecific gravity is 0.00123; it is inodorous and inſipid, reſpirable, and capable of ſupporting inflammation. The atmoſphere, beſides the air now deſcribed, alſo contains other gaſes, vapour, &c.

139. *Nitrous oxide gas* is compoſed of 37 of oxygen, and 63 of nitrogen. It does not change vegetable colours; its ſpecific gravity is 0.00197; it ſuffers no diminution when mixed with oxygen gas. Water abſorbs about half its weight of it, at a mean temperature. It does not combine directly with alkalies; it ſup-

ports combuſtion; and its reſpiration, when perfectly pure, or mixed with atmoſpheric air, produces the higheſt excitement the animal frame ſeems capable of undergoing.

140. *Nitric oxide gas* (nitrous gas) conſiſts, according to Davy, of 44 nitrogen and 56 oxygen. It does not change vegetable colours. Its ſpecific gravity is 0.001343. When mixed with about two-fifths of oxygen gas, they condenſe into red fumes, (nitrous acid), which are entirely abſorbed by water. The quantity of oxygen gas that any air contains is ſometimes eſtimated by the diminution of volume ſuſtained after a ſufficient quantity of nitrous gas has been mixed with it. Water abſorbs 0.118 of its bulk of this gas. It is not inflammable; and only in very few inſtances ſupports combuſtion. It is noxious to vegetation, and its reſpiration is fatal to animals.

141. Nitrogen admits of higher degrees of oxygenizement, forming nitrous and nitric acids.

HYDROGEN.

142. *Hydrogen gas* is often found collected in mines and caverns, It is permanently elaſtic and compreſſible. Its ſpecific gravity is 0.000094, being the lighteſt body with which we are acquainted. It is highly inflammable, and burns in contact with oxygen gas or atmoſpheric air, and detonates on the application of a burning body when mixed with them. It extinguiſhes flame, and is deleterious to animal life. It diſſolves ſulphur, phoſphorus and carbon, forming with them peculiar fetid gaſes.

PRIMARY COMPOUNDS OF HYDROGEN.

A. Binary,
    a. With oxygen; water.
    b. With nitrogen; ammonia.
    c. With ſulphur; ſulphuretted hydrogen.
    d. With phoſphorus; phoſphuretted hydrogen.
B. Ternary,
    a. With carbon and oxygen:
        1. Oxides; hydro-carbonous oxides, vegetable ſubſtances.
        2. Acids; vegetable acids.
    b. With ſulphur and oxygen; ſulphuretted hydrogen.
C. Quaternary,
    With carbon, nitrogen, and oxygen:
        1. Animal oxides.
        2. ——— acids.

143. Hydrogen, combined with oxygen in the proportion of 14.42, to 85.58, forms *water*. Water is tranſparent, colourleſs,

inodorous, and inſipid. As water is aſſumed as the ſtandard, or unity, in all tables of ſpecific gravity, it is neceſſary to know that a cubic inch of it weighs, at 30 inches barometer, and 60° thermometer, 252,422 grains. At 32° it exiſts in a ſolid form, and is cryſtallized. At 212° it expands to 2000 times its bulk, and is converted into a very elaſtic vapour. It abſorbs ſmall quantities of the ſimple gaſes, eſpecially oxygen. It diſſolves ſeveral of the ſalifiable baſes, and in ſome degree all ſaline bodies, and is eſſential to their cryſtallization. It is compoſed and decompoſed in many inſtances, and its chemical agency is almoſt univerſal. It is the only binary combination of hydrogen with oxygen.

144. *Ammonia* (hydroguret of nitrogen) conſiſts of 80 parts of nitrogen, with 20 of hydrogen. It exiſts in its pureſt form combined with caloric as a gas, which is perfectly tranſparent and colourleſs, elaſtic and compreſſible; ſpecific gravity 0.000732; has a urinous and acrid odour, irritating the noſtrils and eyes, and an acrid and cauſtic taſte; does not diſſolve animal ſubſtances; is irreſpirable; extinguiſhes flame; colours vegetable blues green; and is decompoſed by being tranſmitted through a red-hot tube, and by the electric ſpark, into its conſtituent gaſes; and by oxygen and atmoſpheric air at a red heat, and by oxy-muriatic acid, it is converted into water and nitrogen gas. It is abſorbed without change by porous bodies; it diſſolves ſulphur and phoſphorus; and combines readily with water in all its ſtates. Water is ſaturated by one-third of its weight of gaſeous ammonia, and is thereby increaſed in bulk, and acquires the ſpecific gravity of 0.905. Ammonia combines with all the acids, forming neutral ſalts. It is formed during the putrefactive fermentation; and is commonly claſſed with the alkalies. *Officinal.*

CARBON.

145. *Carbon,* in a ſtate of perfect purity, is well known by the name of diamond. It poſſeſſes the higheſt degree of luſtre, tranſparency, and hardneſs. It is cryſtallized, and generally colourleſs. Its ſpecific gravity is from 3.44 to 3.55. It is inſoluble in water, and can neither be melted nor vaporized by caloric. It is not acted upon by any chemical agent, except oxygen at very high temperatures. When expoſed in oxygen gas to the rays of the ſun, concentrated by a very powerful lens, its ſurface becomes ſenſibly blackened; it is ignited, and at laſt conſumed. The reſult of this combuſtion is carbonic acid gas; 100 parts of which conſiſt of 17.88 of carbon, and 82.12 of oxygen. It combines with iron, forming ſteel. It is a conſtituent of almoſt all animal and vegetable ſubſtances; and an oxide of carbon is obtained from them by expoſing them to heat in cloſed veſſels.

PRIMARY COMPOUNDS of CARBON.

- A. Binary,
  - *a.* With Oxygen:
    - 1. Incombuſtible coal; plumbago;
    - 2. Charcoal (carbonous oxide) } oxides.
    - 3. Gaſeous oxide of carbon (carbonic oxide gas.)
    - 4. Carbonic acid.
  - *b.* With metals; carburets.

- B. Ternary with oxygen and hydrogen:
  - 1. Oxides.
    - *a.* Hydro-carbonous.
    - *b.* Alcohol.
    - *c.* Ether.
    - *d.* Fixed oil and fats.
    - *e.* Wax.
    - *f.* Adipocere.
    - *g.* Volatile oils.
    - *h.* Reſins.
    - *i.* Camphor.
    - *k.* Starch.
    - *l.* Sugar.
    - *m.* Jelly.
    - *n.* Tannin.
  - 2. Acids.
    - *a.* Acetic.
    - *b.* Oxalic.
    - *c.* Tartaric.
    - *d.* Citric.
    - *e.* Malic.
    - *f.* Lactic.
    - *g.* Gallic.
    - *h.* Mucic.
    - *i.* Benzoic.
    - *k.* Succinic.
    - *l.* Camphoric.
    - *m.* Suberic.
    - *n.* Laccic.
    - *o.* Sebacic.

- C. Quaternary with nitrogen, hydrogen, and carbon.
  - 1. Oxides.
    - *a.* Gum.
    - *b.* Tragacanth.
    - *c.* Extractive.
    - *d.* Gum reſin.
    - *e.* Bitter principle.
    - *f.* Narcotic principle.
    - *g.* Acrid principle.
    - *h.* Cinchonin.
    - *i.* Indigo.
    - *k.* Lignin.
    - *l.* Suber.
    - *m.* Caoutchouc.
    - *n.* Gelatin.
    - *o.* Albumen.
    - *p.* Fibrin.
    - *q.* Urea.
  - 2. Acids.
    - *a.* Pruſſic.
    - *b.* Uric.
    - *c.* Amnic.

146. *Plumbago* and *incombuſtible coal* contain carbon in the firſt degree of oxygenizement. The moſt remarkable known property

of this oxide, is the very high temperature neceſſary for its combuſtion.

147. Common *charcoal* of wood (carbonous oxide) is carbon in the ſecond degree of oxygenizement, conſiſting of 63.86 of carbon, and 36.14 of oxygen. It is obtained in the form of ſolid maſſes of a black colour. It has neither ſmell nor taſte. It is brittle and never cryſtallized. It abſorbs light ſtrongly, is perfectly refractory in the fire, inſoluble in water, and a bad conductor of caloric, but an excellent one of electricity. At a red heat, it burns rapidly in oxygen gas, 28 of charcoal and 62 of oxygen forming 100 of carbonic acid gas. It alſo burns in atmoſpheric air, but leſs vividly.

148. *Gaſeous oxide of carbon* (carbonic oxide gas) is carbon in its third degree of oxygenizement. It is inviſible and elaſtic; ſpecific gravity 0.001167. It does not ſupport combuſtion or reſpiration. With oxygen gas it burns with a lambent blue flame, and is converted entirely into carbonic acid without producing any moiſture. It has no affinity for lime. It conſiſts of 25.99 carbon, and 74.11 oxygen; or 40.41 charcoal, and 59.59 oxygen.

SULPHUR.

149. *Sulphur* is a cryſtallizable ſolid; of a yellow colour; little ſenſible taſte; particular ſmell; ſpecific gravity 1.9907; brittle; electric; fuſible at 234°; burning with a pale blue flame at 302°; and with a bright white flame at 570°; and capable of combining with different proportions of oxygen. It is found pure in the neighbourhood of volcanoes, and exiſts in many minerals, and in animal ſubſtances. *Officinal.*

PRIMARY COMPOUNDS of SULPHUR.

a. With oxygen:
  1. Protoxide of ſulphur.
  2. Peroxide of ſulphur.
  3. Sulphureous acid.
  4. Sulphuric acid.
b. With nitrogen. Sulphuretted nitrogen gas.
c. With hydrogen. Sulphuretted hydrogen.
d. With phoſphorus. Sulphuretted phoſphorus.
e. With ſalifiable baſes. Earthy and alkaline ſulphurets.
f. With metals. Metallic ſulphurets.

150. *Oxide of Sulphur* is of a dark violet colour, and an auſtere taſte, fracture fibrous, ſp. gr. 2.325; conſiſtence tough. It contains 2.4 per cent of oxygen. It is formed on the ſurface of melted ſulphur.

151. *Peroxide of Sulphur* contains 6.2 per cent of oxygen, and was procured by Dr. Thomſon by paſſing a current of oxy-muriatic acid gas through flowers of ſulphur. It is in this ſtate that he ſuppoſes ſulphur to exiſt in ſulphuretted hydrogen gas, and the hydroſulphurets.

152. *Sulphuretted Nitrogen Gas* is only known to have a fetid odour.

153. *Sulphuretted Hydrogen Gas* conſiſts of 71 ſulphur, and 29 hydrogen; ſpecific gravity 0.000135. It has the odour of rotten eggs; is not reſpirable; burns with oxygen gas without exploding, and ſulphur is depoſited; is readily abſorbed by water, and is the mode in which ſulphur exiſts in mineral waters; reddens vegetable blues; and in its affinities, and the cryſtallizability of its compounds, it reſembles the acids. *Officinal.* Hydro-ſulphuret of ammonia.

154. *Hydroguretted Sulphur* is ſulphuretted hydrogen combined with an additional doſe of ſulphur. It has the appearance of a yellow oil.

155. *Sulphurets* are ſolid opaque bodies, of conſiderable ſpecific gravity, decompoſible by heat, water, and the acids.

a. The alkaline and earthy ſulphurets have a red or browniſh-red colour, and by ſolution in water are immediately converted into hydroguretted ſulphurets. Sulphuret of potaſs is officinal.

b. The metallic ſulphurets have neither taſte nor ſmell, are often poſſeſſed of metallic brilliancy, and are conductors of electricity. *Officinal.* The Sulphurets of antimony, of mercury, of iron.

PHOSPHORUS.

156. *Phoſphorus* is a ſemi-tranſparent ſolid, ſlightly brilliant, and of a waxy conſiſtence; ſpecific gravity 1.770; taſte in ſome degree acrid and diſagreeable; ſmell alliaceous. It is brittle under 32°; its fracture is vitreous, brilliant, and ſometimes lamellated; above 32° it ſoftens a little, becomes ductile about 90°, melts at 99°, becoming tranſparent like a white oil; at 180° begins to be vaporized, and at 554° boils. It is cryſtallizable into priſmatic needles or long octohedrons. It exiſts in many minerals, and is obtained from bones and other animal ſubſtances.

PRIMARY COMPOUNDS of PHOSPHORUS.

a. With oxygen:
  1. Oxide of phoſphorus.
  2. Phoſphorous acid.
  3. Phoſphoric acid.

b. With nitrogen. Phoſphuretted nitrogen gas.
c. With hydrogen. Phoſphuretted hydrogen gas.
d. With ſulphur. Phoſphuretof ſulphur.
e. With metals. Metallic phoſphurets.
f. With ſalifiable baſes. Alkaline and earthy phoſphurets.

157. In its ſolid ſtate, phoſphorus is not acted upon by pure oxygen gas, but when melted, burns in it at 80° with a dazzling ſplendour, abſorbing about half its weight of oxygen, and forming phoſphoric acid. In atmoſpheric air, it undergoes a ſlow combuſtion at 43°, emitting light in the dark, but without the production of ſenſible heat; abſorbing a portion of oxygen, and forming phoſphorous acid; at 148° it burns rapidly, but leſs brilliantly than in oxygen gas, forming phoſphoric acid. It is therefore always kept immerſed in boiled water; but even there its ſurface is oxidized, becoming white and opaque.

158. *Hydroguretted phoſphorus* poſſeſſes a peculiar odour, and the property of becoming luminous when mixed with oxygen gas. It may be combined with a much larger proportion of phoſphorus, acquiring then a fetid alliaceous odour, a conſiderable increaſe of ſpecific gravity, and the property of burning by the ſimple contact of oxygen, or of the atmoſphere, with a very brilliant white flame.

159. *Sulphuretted phoſphorus*, and phoſphuretted ſulphur, are of a yellowiſh colour, more fuſible than either of the components, and exceedingly inflammable.

160. Nitrogen gas diſſolves phoſphorus, forming a fetid gas, which inflames at a low temperature.

161. Phoſphuret of lime is inſoluble in water; but when thrown into it, decompoſes it, and produces phoſphuretted hydrogen gas, whoſe bubbles catch fire when they burſt on the ſurface of the water. Phoſphuret of baryta is a brown maſs; of a metallic appearance; very fuſible; luminous in the dark; decompoſed by expoſure to air; emitting an alliaceous ſmell when moiſtened; and decompoſed by water, furniſhing phoſphuretted hydrogen gas. The phoſphuret of ſtrontia is very ſimilar.

METALS, and METALLIC OXIDES.

162. Metals are cryſtallizable; their form depends on the regular tetrahedron or cube; their ſurface is ſpecular; they are perfectly opaque, even when melted; their colour is various; their luſtre peculiar and ſhining, or ſplendent; their hardneſs various, but at leaſt conſiderable; many of them are brittle, others poſſeſs malleability and ductility in a ſurpriſing degree, and ſome are ſciſſile, flexile, or elaſtic; their fracture in general is hackly; their

texture compact, fibrous or foliated; many of them are remarkably ſonorous; their ſpecific gravity greater than 5; they poſſeſs no ſmell or taſte, unleſs when heated or rubbed; they are the beſt conductors of caloric and electricity; are powerful agents in producing the galvanic phenomena, and a few of them are the only ſubſtances which exhibit the phenomena of magnetiſm. By the action of caloric they are melted, but with different degrees of facility, and ſome of them may be vaporized. Except iron and platinum, they melt ſuddenly, without undergoing any intermediate ſtate of ſoftneſs; and when melted, their ſurface is convex and globular. They are inſoluble in water, but ſome of them decompoſe it, and are oxidized by it.

PRIMARY COMPOUNDS of the METALS.

a. With oxygen:
  1. Metallic oxides.
  2. Acids of arſenic, tungſten, molybdenum, chrome, and columbium.

b. With hydrogen. Hydrogurets.
c. With carbon. Carburets.
d. With phoſphorus. Phoſphurets.
e. With ſulphur. Sulphurets.
f. With each other. Alloys and amalgams.

163. They are oxidized with different degrees of facility, ſome by mere expoſure to air, and others ſeem almoſt to reſiſt the action of heat and air. Their oxidizability is always increaſed by increaſe of temperature. Their oxides are in the form of powder, laminæ, or friable fragments; ſometimes cryſtalline; of various colours, determinate with regard to each metal; poſſeſs greater abſolute weight; are refractory, or fuſible into glaſs; inſipid, or acrid, and ſtyptic; in general inſoluble in water; and combine either with acids and alkalies, or only with acids. Some of thoſe are diſoxygenized by light alone, others by caloric, and others require hydrogen, carbon, &c.

164. Moſt of them are capable of combining with different proportions of oxygen. Dr. Thomſon propoſes to call the oxides with a minimum of oxygen Protoxides, and with additional doſes Deutoxides, Tritoxides, &c. in ſucceſſion, and the oxides with a maximum of oxygen Peroxides.

165. Hydrogen gas is capable of holding arſenic, zinc, and iron, in ſolution.

166. Carbon unites only with iron.

167. The metallic phoſphurets are fuſible, brilliant, brittle, granulated, lamellated, ſcarcely combuſtible, and permanent.

168. The ſulphurets are brittle; cryſtallizable in large brilliant and metallic laminæ, more eaſily fuſible than the refractory metals, but leſs eaſily than the very fuſible metals; decompoſable by heat, humidity, and the acids.

169. The mixtures of the metals with each other are termed alloys: thoſe in which mercury is contained are amalgams. They acquire by mixture new properties, and are in general more fuſible than their components. The reguline metals are not ſoluble in the acids; but when acted upon by them, are firſt oxidized, and then diſſolved. The metallic oxides, by fuſion, colour glaſſes and enamels.

Oxidizable Metals.

170. *Gold* is of a brilliant, yellow colour, inſipid, inodorous; ſpecific gravity between 19.258 and 19.300; ſoft and flexible; little elaſticity or ſonorouſneſs; ſo ductile, that its ſurface may be extended more than 650.000 times; of very great tenacity; eaſily hammer-hardened; a good conductor of caloric, electricity, and galvaniſm; fuſing at 32° of Wedgewood; brittle when cooled too quickly; cryſtallizing in octohedrons; unalterable in the air; converted, by a long and violent heat, into a vitrified, violet oxide; oxidized and diſperſed by electricity; ſoluble in alkaline ſulphurets; rendered brittle by phoſphorus, arſenic, biſmuth, tin, and antimony; leſs brittle by lead; ſoluble in mercury; hardened by zinc, copper, iron, ſteel, and ſilver; oxidizable, of a purple colour, and ſlightly ſoluble, in nitrous acid; very oxidizable, of a fawn or yellow colour by the nitro, or oxy-muriatic acids. Its oxide is eaſily reduced by light and heat; colours glaſſes purple or topaze-yellow, and forms a fulminating compound with ammonia.

171. *Platinum*. Of a grey, white colour, almoſt black when poliſhed, inſipid, inodorous; ſpecific gravity 20.850 to 21.061; ſofter only than iron, and leſs ductile only than gold; moſt difficult of fuſion, above 160° of Wedgewood; a good conductor of electricity and galvaniſm; unalterable by air and heat; converted into a grey powder, its firſt degree of oxidization, by electricity; unites with phoſphorus; forms alloys with arſenic, biſmuth, antimony, mercury, zinc, tin, lead, caſt-iron, copper, ſilver, and gold. It is oxidized and diſſolved by the oxy-muriatic acid, and more readily by the nitro-muriatic. Oxide grey.

172. *Silver*. Very brilliant, white, inſipid, inodorous; ſpecific gravity 10.474 to 11.091; hardneſs between iron and gold; elaſticity between gold and copper; ſtrong acute ſound; conſiderable ductility and tenacity; hardening much under the hammer; a good conductor of electricity, caloric, and galvaniſm; fuſible at 28° Wedgewood; cryſtallizable by cooling; unalterable in the air; changed into a greeniſh oxide by long and violent heat, burning with a greeniſh

flame, and inſtantly by the electric ſhock. Its phoſphuret is granulated, brittle and fuſible; its ſulphuret grey, black, lamellated, or ſtriated and fuſible; it unites but ſlightly with the acidifiable metals and iron; is hardened by gold, biſmuth, antimony, tin, lead, and copper, and amalgamates with mercury. It is oxidized, and diſſolved by the ſulphuric, ſulphurous, nitric, and oxy-muriatic acids. Its oxide is greeniſh; reducible by light and heat, hydrogen, and the other metals; colours ſome glaſſes of an olive green, and is very ſoluble in ammonia. *Officinal.*

173. *Copper.* Bright red; diſagreeable taſte and ſmell when rubbed or heated; ſp. gr. 7.79; ductile; of great tenacity; ſonorous; fuſible at 27° Wedgewood; granulated texture, and ſubject to bliſters; a good conductor of caloric, electricity, and galvaniſm; becomes brown, and at laſt green in the air; when heated, turns blue, yellow, violet, deep brown; when ignited and plunged into water, forms brown, brittle ſcales of oxide. Its phoſphuret is brilliant, brittle, hard, and fuſible; its ſulphuret brown, fuſible, and very phoſphoric; its alloy with arſenic is white, with biſmuth reddiſh, with antimony violet, mercury deep red, with zinc forms braſs, and with tin is orange; it is oxidized and diſſolved by the ſulphuric, nitric, and muriatic acids; its oxide is brown, brittle, and ſoluble in ammonia, producing a beautiful blue. *Officinal.*

174. *Iron* is of a bluiſh-grey colour; texture either fine grained, fibrous or denſe plates; ſapid and odorous; ſpecific gravity 7.600; the hardeſt and moſt elaſtic and moſt tenacious metal; very ductile; fuſing at 158° Wedgewood, fuſion at firſt clammy, afterwards very fluid; ignating by ſtrong percuſſion, and inflaming by the colliſion of flint; magnetic. It is oxidized ſlowly in the air, eſpecially when moiſt; when heated in contact with air, it is changed to a black oxide, containing 20 to 27 of oxygen; fuſible, hard, brittle, lamellated, ſtill attracted by the magnet; afterwards into a brown, red, fine pulverulent oxide, not attracted by the magnet, containing 0.40 to 49 of oxygen. It burns with ſplendour and deflagration in oxygen gas, and is converted into a fuſed, black oxide; it decompoſes water ſlowly, and when ignited, very rapidly. In ſome inſtances it is diſſolved in hydrogen gas. Carbon united to iron, converts it into ſteel. *Officinal.*

175. *Steel* is of a grey colour, brilliant and granular in its fracture; ſpecific gravity 7.795; harder than any of the metals, and more elaſtic, ductile, malleable, and fuſible at a lower temperature than pure iron. Its characteriſtic property is, that after being heated, if ſuddenly plunged into cold water, it becomes harder, more elaſtic, leſs pliable and brittle; but by being again heated and cooled ſlowly, it acquires its former ſoftneſs, pliability and ductility. Steel contains only ſome hundredth parts of car-

bon, and is known chemically, by letting a drop of acid fall upon it, which produces a grey or black ſpot.

176. *Plumbago* conſiſts of about 0.1 of iron, combined with carbon in its firſt degree of oxidizement. The phoſphuret of iron is white, granulated, brittle, permanent in the air. Its ſulpheret is yellow, hard brittle, and very fuſible, oxidizing ſlowly in a humid atmoſphere. Iron forms alloys with arſenic, cobalt, manganeſe, biſmuth, antimony, zinc, and tin. Iron is oxidized and diſſolved by almoſt all the acids; oxides, black, brown, red. It gives glaſſes a brown, ſmoky, deep green, or black colour.

177. *Lead* is of a grey, blue, livid colour, ſtreak grey, diſagreeable taſte and odour; ſpecific gravity 11.352; ſoft; very laminable; hardens little under the hammer; very flexible; ſlightly tenacious; fuſible at 612° Fahrenheit; volatile at a red heat; tarniſhed in the air; ſlightly oxidized by air and water; by heat and air it forms a grey, then a yellow, and laſtly, a red oxide, which is vitrifiable. Its phoſphuret and ſulphuret are brittle; it forms alloys with arſenic, biſmuth, antimony, mercury, zinc, and tin; it is oxidized by, and combines with, the ſulphuric, nitric, muriatic, phoſphoric, and other acids. Its oxides impart to glaſs a uniform denſity, and ſtrong refracting power. *Officinal.*

178. *Tin* is pure, brilliant, white, ſapid, and odorous; ſpecific gravity 7.291 to 7.500, ſoft, flexible, and emitting a crackling noiſe when bent; fuſing at 442° Fahrenheit; oxidizes ſlowly in the air; is converted, when fuſed, into a grey oxide; when red hot it burns vividly. Its ſulphuret and phoſphuret are lamellated and brittle; it forms alloys with arſenic, biſmuth, antimony, mercury, and zinc; it is oxidized by many acids, and combines with the muriatic, fluoric, boracic, and carbonic acids. Its oxide is grey or white, unites readily with ſulphur, and renders glaſſes opaque. *Officinal.*

179. *Zinc* is bluiſh-white, lamellated, ſapid, and odorous; ſpecific gravity 7.190; laminable, ſoft, clogging the file; fuſible at 700°; vaporizible; a powerful agent in the phenomena of galvaniſm; oxidized by fuſion; at a red heat it catches fire, and emits white films of oxide, which contain about 0.33 oxygen; it is ſoluble in hydrogen; it combines with phoſphorus, ſulphur, arſenic, antimony, and mercury; it eaſily decompoſes water; it is oxidized and diſſolved by almoſt all the acids. Oxide, white films. *Officinal.*

180. *Mercury.* Very bright white; ſpecific gravity 13.568; freezing at —39; boiling at 660°, partly ductile and malleable; oxidizible by trituration in the air, and in a farther degree by the action of the air and heat; does not decompoſe water; forms amalgams with many metals; and is oxidized and diſſolved by the ſulphuric, nitric, and oxy-muriatic acids. Oxides, black, yellow, red. *Officinal*

181. *Tellurium.* White, lead grey, very bright; harſh and brittle; lamellated; cryſtallizable; ſpecific gravity 6.115; very fuſible and volatile; burns with a blue and greeniſh flame, and a white ſmoke, having the odour of radiſh; oxide very fuſible into a ſtraw-coloured radiated glaſs; ſoluble in ſulphuric, nitric and nitro-muriatic acids; unites with ſulphur. Oxides, black, white.

182. *Antimony.* White, very brilliant, lamellated; ſpecific gravity 6.702; moderately hard; pulverizable; fuſible at 809°; volatile when highly ignited; ſenſible taſte and ſmell; unalterable in cold air; oxidizible by air and heat; oxide fuſible into a yellow brown glaſs; decompoſes water when ignited; oxidized by the ſulphuric, nitric, and muriatic acids; combines with phoſphorus and ſulphur. Oxides, black, brown, orange, yellow, white; and colour glaſs yellow or hyacinthine. *Officinal.*

183. *Biſmuth.* White, ſlightly yellow, in large ſpecular plates; pulverizable; ſpecific gravity 9.822; moderately hard; ſenſible odour and taſte; fuſible at 460°, and volatile at a high temperature; oxidizible by heat and air; oxide vitrifiable into a greeniſh yellow glaſs; oxidizible by boiling ſulphuric, nitric, and muriatic acids; unites with ſulphur. Oxides grey, yellow, dirty green, and colour glaſs of a greeniſh yellow.

184. *Manganeſe.* Small whitiſh grey globules; ſpecific gravity 6.850; very hard and very brittle; very difficult of fuſion; very oxidizible by expoſure to air; decompoſes water ſtrongly; is oxidized by the ſulphuric, nitric, muriatic acids; combines with many metals. Oxides white, red, brown and black; colour brown, violet, or red; diſcolour glaſs coloured by iron.

185. *Nickel.* Yellow or reddiſh-white, granulated; ſpecific gravity nearly 9.; very difficult of fuſion, and of oxidization in the air; oxidizible by moſt of the acids, which it colours of a brilliant green; combines with phoſphorus, ſulphur, and the metals. Oxide light clear green, colouring glaſs brown, orange, red.

186. *Cobalt.* Reddiſh-grey, fine grained, pulverizable; ſpecific gravity between 7.700 and 7.800; very difficult of fuſion; oxidizible before fuſion; unalterable by water; attacked by all the acids; combines with phoſphorus and ſulphur; its alloys are granulated, rigid, and brittle. Oxide deep blue or black, and colours glaſſes of a fine blue.

187. *Uranium.* An incoherent maſs of ſmall agglutinated globules, of a deep grey and pale brown; ſpecific gravity 6.440; very hard; very difficult of fuſion, even by long continued heat; is attacked by ſeveral of the acids; combines with phoſphorus. Oxide ſoluble in the alkalies, and very ſoluble in their carbonates. Oxide yellow, colouring glaſs of a greeniſh yellow, emerald green, or various brown.

188. *Titanium.* Agglutinated, hard, friable maſſes, cryſtallized,

internally of a brilliant red; infuſible; unalterable by water; oxidizible by boiling ſulphuric, nitric, and muriatic acids. Oxides, blue, deep red, white.

Acidifiable Metals.

189. *Chromum.* Agglutinated maſſes of a whitiſh grey colour; very hard, very brittle, and very infuſible; appears to be difficult to oxidize and eaſy to diſoxidize; does not appear to decompoſe water; not attacked by the ſulphuric or muriatic acids; changed into a green oxide, and afterwards into a red acid, by the nitric acid diſtilled from it. Oxide of a beautiful emerald green; acid a red or orange yellow powder.

190. *Molybdenum.* In black powder, or agglutinated, blackiſh, friable maſſes, having little metallic brilliance; ſpecific gravity 6; by a ſtrong heat changes into a white brilliant oxide in needles, and very acidifiable; oxidizible by boiling ſulphuric acid, and acidifiable by the nitric acid. It forms a ſulphuret; and its alloys are granulated and friable; acid white, pulverulent, ſtyptic, ſpecific gravity 8.400.

191. *Tungſten.* Small ſlightly adherent globules of a ſlate-grey; ſpecific gravity 17.5; very infuſible; oxidizible in the air by heat, and afterwards acidifiable. Oxide yellow, pulverulent, colouring glaſs of a blue or brown colour; and a white harſh powder; ſpecific gravity 6.12.

192. *Arſenic.* Grey plates of a lively brightneſs; friable; ſpecific gravity between 8.310 and 5.703; vaporizable at 540°; emitting a ſmell like garlic; cryſtallizable; oxidizible in the cold air; inflammable at a red heat, and ſublimed in the form of the white oxide or acid; farther oxidizible by the nitric and nitrous acids; combines with phoſphorus, ſulphur, and many of the metals; ſoluble in hydrogen gas.

193. *Columbium* has hitherto been examined only in the ſtate of columbic acid, which is a white powder inſoluble in water.

Acids with Simple Bases, and their Compounds.

194. The ſimple ſubſtances, in their extreme ſtates of oxygenizement, conſtitute a ſtrongly marked claſs of bodies termed acids, which are diſtinguiſhed by the following properties:

a. Their taſte is ſour;
b. They change vegetable blues to red;
c. They combine with water in almoſt any proportion, without ſuffering any change in their properties, except what depend on dilution.

d. They unite with alkalies, earths, metallic oxides; forming compounds with them, poſſeſſed of new properties, and commonly known by the names of Neutral and Metallic ſalts.

195. Beſides ſome of the metals, hydrogen is the only ſimple ſubſtance which does not ſeem to be capable of acidification; and, on the other hand, there are three acids, the muriatic, boracic, and fluoric, with whoſe compoſition we are ſtill unacquainted.

196. *Carbonic acid gas* is tranſparent, colourleſs, without ſmell, irreſpirable, and incapable of ſupporting inflammation; its ſpecific gravity is 0.0018. Water abſords an equal bulk of it at 41°, acquiring a ſpecific gravity of 1,0015, and an agreeable acidity and ſparkling appearance, eſpecially if heated to 88°. It is ſeparated from water by freezing or boiling. It is alſo abſorbed by alcohol, oil of turpentine, and olive oil. It contains 17.88 carbon, and 82.12 oxygen, or 28 charcoal and 72 oxygen. Its compounds are denominated Carbonates. *Officinal.*

197. The *carbonates* always preſerve their alkaline properties in ſome ſlight degree. They are decompoſed by all the acids, forming a briſk efferveſcence, which is colourleſs. The carbonates of the metals very much reſemble their oxides. *Officinal.* Carbonates of baryta, of lime, of magneſia, of potaſs, of ſoda, of ammonia, of zinc, of iron.

198. *Nitrous acid* is of a brown or red colour, exceedingly volatile and emitting an intolerable and ſuffocating odour. By the addition of water, its colour is ſucceſſively changed to blue, green, and yellow. In the ſtate of vapour, it is abſorbed by water, oil, and ſulphuric acid. It conſiſts of about 70 parts of oxygen, and 30 of nitrogen, or rather of nitric acid and nitric oxide. It forms Nitrites. *Officinal.*

199. The *nitrites* are characterized by their emitting the nitrous acid in orange fumes, on the addition of ſulphuric acid.

200. *Nitric acid* conſiſts of nitrogen combined with oxygen. It is liquid, colourleſs, and tranſparent. It is very corroſive, and tinges the ſkin of a yellow colour. It has a ſtrong affinity for water, and abſorbs it from the atmoſphere. When moſt concentrated, its ſpecific gravity is 1.504. It produces heat when mixed with water. It is decompoſed by many ſubſtances. Light converts it in part into nitrous acid. When entirely deprived of water, it ſets fire to oils, to ſulphuretted hydrogen gas, to iron filings, when perfectly dry; and to zinc, biſmuth, and tin, when poured on them in a ſtate of fuſion. It oxygenizes all the metals, except gold, platinum, and titanium. It conſiſts of 70.50 by weight, of oxygen, and 29.50 of nitrogen. *Officinal.*

201. The *nitrates*, by the action of fire, furniſh impure oxygen gas, mixed with nitrogen, and are reduced to their baſis. By the action of concentrated ſulphuric acid, they emit a white vapour,

and they are capable of ſupporting combuſtion. *Officinal.* Nitrates of potaſs, and of ſilver.

202. *Sulphurous acid gas* is colourleſs, incapable of maintaining combuſtion, and deleterious when reſpired. It has a ſtrong ſuffocating odour; its ſpecific gravity is 0.00246, or 0.00251. Water at 54° rapidly abſorbs one-fourth of its weight of this gas, and when ſaturated, acquires the ſpecific gravity of 1.040. It is again expelled from it by heat, but not by freezing. It is alſo abſorbed by ſulphuric acid, to which it imparts the property of cryſtallizing, forming what is called glacial ſulphuric acid; oils and ether. When water is preſent, it is converted by oxygen gas into ſulphuric acid. It is decompoſed by hydrogen, carbon, and ſulphuretted hydrogen gas, when aſſiſted by heat. It oxidizes iron, zinc, and manganeſe. It conſiſts of 85 ſulphur, and 15 oxygen.

203. The *ſulphites*, by the action of heat, furniſh ſulphur, and become ſulphates. They are alſo converted into ſulphates, with efferveſcence, and exhalation of ſulphurous vapours, by the ſulphuric, nitric, muriatic, and other acids, and gradually, by expoſure to the atmoſphere when dry, and very quickly when diſſolved.

204. *Sulphuric acid* is alſo compoſed of ſulphur and oxygen. It may be obtained in a cryſtallized or glacial form, but generally exiſts as a denſe liquid; ſpecific gravity 1.85; ſlightly viſcid; tranſparent and colourleſs; without ſmell; of a ſtrong acid taſte. At 36° it freezes; it boils at 590°. It has a ſtrong attraction for water, abſorbing it rapidly from the atmoſphere, and producing conſiderable heat when mixed with it. It is decompoſed by moſt inflammable ſubſtances. It does not oxidize gold, platinum, tungſten, or titanium. It decompoſes the alkaline and earthy ſulphurets, and reduces all organic ſubſtances to charcoal. In medicine it is a powerful refrigerent and antiſeptic. It contains 56 ſulphur, and 44 oxygen. *Officinal.*

205. The *ſulphates* form ſulphurets, when heated to redneſs with charcoal, and furniſh copious precipitates with ſolutions of baryta. *Officinal.* Sulphates of baryta, potaſs, ſoda, zinc, copper, iron, mercury.

206. *Phoſphorous acid* is a white fluid of an oily appearance. It has a fetid odour, and diſagreeable taſte; and gives out a thick white ſmoke and vivid flame when ſtrongly heated. It is decompoſed by ignited charcoal. The proportions of phoſphorus and oxygen have not been aſcertained.

207. The *phoſphites* are fuſible, and when heated in cloſe veſſels furniſh a little phoſphorus, and become phoſphates. When heated in the open air, they emit a phoſphoreſcent light, and often flaſhes of flame, accompanied by a ſtrong ſmell of garlic, and a thick white vapour, and are converted into phoſphates.

208. *Phoſphoric acid* is compoſed of phoſphorous acid and oxygen.

It is cryſtallizable, fuſible, and vitreſcent. Its ſpecific gravity is 2.687. It readily attracts moiſture from the atmoſphere, and then its ſpecific gravity becomes 1.417. Its mixture with water produces little increaſe of temperature. It is decompoſed at a high temperature by hydrogen and carbon, and by ſeveral of the metals. It conſiſts of 40 phoſphorus and 60 oxygen.

209. The *phoſphates* are cryſtallizable, fixed, fuſible, vitrifiable, and phoſphoreſcent. They are not decompoſed by charcoal. They are ſoluble in nitric acid without effervеſcence, and precipitable from that ſolution by lime water. *Officinal.* Phoſphate of ſoda.

Metallic Acids and their Compounds.

210. *Arſenious acid* is of a white colour; has a ſharp acrid taſte, and an alliaceous ſmell; ſpecific gravity 3.706; is ſoluble in 80 times its weight of water at 60°, and in 15 at 212°. At 283° it ſublimes; if heated in cloſe veſſels is vitrified, and its ſpecific gravity becomes 5.000. It conſiſts of 75 of arſenic, and 25 of oxygen, and is a moſt virulent poiſon. *Officinal.*

211. The *arſenites* are ſcarcely known; but their acid is driven off by heat, and is precipitated by all the acids.

212. *Arſenic acid* conſiſts of arſenious acid and oxygen. It is not cryſtallizable; has an acid cauſtic taſte, and is not volatile, but very fixed and vitrifiable. Its ſpecific gravity is 3.391. It attracts moiſture from the atmoſphere, and is ſoluble in two thirds of its weight of water. By a red heat it loſes part of its oxygen, and becomes arſenious acid. It conſiſts of 8 parts of arſenious acid, and 1 of oxygen, or of 65 arſenic, and 35 oxygen.

213. The *arſeniates* are decompoſed by charcoal at a high temperature.

214. *Tungſtic acid* is a white powder of a rough, metallic, and feebly acid taſte. Its ſpecific gravity is 3.600. It is ſoluble at 212° in twenty waters. Expoſed to heat it becomes yellow, brown, and laſtly black; emits no ſmoke, and is not fuſed; but loſes its ſolubility in water. The ſulphuric acid changes its colour to blue, and the nitric and muriatic acids to a fine yellow.

215. The *tungſtates* are little known.

216. *Molybdic acid* is a white powder of an acid but metallic taſte. Its ſpecific gravity is 3.400. It is not altered in the air. It is melted, and is fixed in a covered crucible; but when the cover is removed, it ſublimes in a white ſmoke, which condenſes in brilliant yellow ſcales. It diſſolves at 212° in 960 waters. By heat it forms a blue ſolution in ſulphuric acid. It is alſo ſoluble in the muriatic, but not in the nitric acid.

217. The *molybdates* are ſcarcely known.

218. *Chromic acid* is a red or yellow orange powder, of a parti-

cular, rough, metallic taſte. It is ſoluble in water, and may be obtained in ruby-coloured cryſtals. It is decompoſable by heat and light, paſſing to the ſtate of green oxide. It is reduced by heat and charcoal. It oxygenizes the muriatic acid.

219. The *chromates* are of a yellow or orange colour.

220. *Columbic acid* is a white powder, which reddens litmus paper, although it ſeems inſoluble in water. It is ſoluble in boiling ſulphuric and muriatic acids, but not in the nitric. It is precipitated from its ſolutions by water, potaſs, and ſoda. With pruſſiate of potaſs it forms an olive green precipitate, and with tincture of galls, a deep orange precipitate. It combines with potaſs and ſoda, and expels carbonic acid. It does not unite with ammonia.

221. *Columbate* of potaſs reſembles boracic acid in its appearance.

222. Other metallic oxides ſeem capable of acidification; but our information reſpecting them is not yet ſufficient to enable us to enumerate their properties.

UNDECOMPOSED ACIDS and their COMPOUNDS.

223. *Muriatic acid gas* is tranſparent and colourleſs. It deſtroys life, and extinguiſhes flame. Its ſpecific gravity is 0.002315. Water is capable of diſſolving about an equal weight of it. Its ſpecific gravity is then 1.500; it is generally of a pale yellow colour; is very volatile, and emits white fumes of a peculiar unpleaſant odour. The gas decompoſes alcohol and oil, and deſtroys putrid exhalations. It is farther oxygenized by the nitric acid. *Officinal.* Muriatic acid.

224. The *muriates* have a more or leſs pure ſalt taſte. They are not acted upon by any combuſtible body. They are all ſoluble in water, and are the moſt volatile and moſt difficultly decompoſed by heat of the neutral ſalts. They emit white fumes with the ſulphuric acid, and oxy-muriatic acid gas with the nitric. *Officinal.* Muriates of ſoda, ammonia, baryta, lime, mercury, antimony.

225. *Oxygenized muriatic acid* (or by contraction, oxy-muriatic acid) *gas* is compoſed of muriatic acid 84 and oxygen 16. It is of a yellow colour, and very pungent ſmell, and acrid taſte. It ſupports flame, but is deleterious when reſpired. It deſtroys the vegetable colours. It oxygenizes all oxygenizable ſubſtances, (14. B. *b b.*), and repaſſes to the ſtate of muriatic acid. It is decompoſed by light. It does not unite readily with water. Water when ſaturated with it weighs 1.003.

226. The *oxy-muriates* have lately had their exiſtence rendered doubtful by Mr. Chenevix.

227. *Hyper-oxygenized muriatic acid* conſiſts of muriatic acid 35, and oxygen 65. It has not been obtained in a ſeparate ſtate.

228. *Hyper-oxy-muriates* give out very pure oxygen gas by the action of caloric, and become muriates. Their acid is expelled from them with noiſe, by the ſtronger acids; and they inflame combuſtible bodies, even ſpontaneouſly, and with detonation.

229. *Fluoric acid gas* is inviſible, irreſpirable, and extinguiſhes flame. It has a pungent ſmell, approaching to that of muriatic acid. It is heavier than common air. It corrodes the ſkin. It is abſorbed by water. Its moſt remarkable property is that of diſſolving ſilica. Its compoſition is unknown.

230. *Fluates* afford, when treated with concentrated ſulphuric acid, a vapour which corrodes glaſs, and from which the ſilica is afterwards precipitated by water.

231. *Boracic acid* exiſts in the form of ſmall, ſhining, laminated cryſtals. Specific gravity is 1.479. It is fixed and vitrifiable in the fire. It is ſoluble in fifty parts of boiling water. It is alſo ſoluble in alcohol, to which it imparts the property of burning with a yellow flame. It oxidizes only iron and zinc.

232. *Borates* are vitrifiable; and their concentrated ſolutions afford, when heated with the ſtrong ſulphuric acid, brilliant, lamellated cryſtals. *Officinal.* Sub-borate of ſoda.

Of COMPOUND OXIDES and ACIDS.

233. We have already noticed all the binary combinations which oxygenizable ſubſtances form with oxygen. Theſe in general have conſiderable permanence in their characters, and admit of few variations in the proportions of their conſtituent principles. But oxygen is capable of entering into combination at the ſame time with more than one of theſe ſimple oxygenizable ſubſtances, forming oxides and acids, with double or triple baſes, which, in conſequence of the increaſed number of principles, are ſubject to greater variations in the proportion of theſe, and are leſs permanent in their characters. Theſe are, however, the ſubſtances in which pharmacy is chiefly engaged, as they comprehend the whole of the vegetable and animal kingdoms. Chemiſts borrowing their arrangement from natural hiſtory, have almoſt always conſidered them under the title of Vegetable and of Animal Subſtances. But ſuch an arrangement is ſo totally unconnected with the principles of chemiſtry, that the imperfect ſtate of our knowledge is the only apology that can be offered for its continuance; and imperfect as that knowledge is, we are perſuaded, that even a very imperfect attempt, at a chemical claſſification of theſe bodies, is to be preferred.

Compound Oxides.

234. The compound oxides are characterized by their great alterability, and by their affording, when burnt with a ſufficient quantity of oxygen, both water and carbonic acid. They may be divided into

a. Ternary oxides (145 B.) containing various proportions of carbon, hydrogen, and oxygen.
b. Quaternary oxides (145 C.) conſiſting of nitrogen, carbon, hydrogen, and oxygen.

235. The ternary oxides coincide nearly with the claſs of vegetable ſubſtances, and are characterized

a. By their being converted entirely into water and carbonic acid gas, when completely decompoſed by oxygen.
b. By their undergoing the acid fermentation, from the action of air and water.
c. And by their furniſhing nitrous gas and carbonic acid, when treated with nitric acid.

236. The quaternary oxides coincide nearly with animal ſubſtances, and are characterized;

a. By their furniſhing, when decompoſed by oxygen, ammonia as well as water and carbonic acid gas.
b. By their becoming putrid from the action of air and water.
c. And by their furniſhing nitrogen gas when treated with nitric acid.

Ternary Oxides.

237. The ternary oxides (235.) may be ſubdivided into gaſeous, fluid, or eaſily fuſible, and ſolid infuſible. In general the gaſeous and volatile compound oxides, contain the largeſt proportion of hydrogen, and the infuſible denſe oxides the largeſt proportion of carbon.

238. *Hydro-carbonous oxides* (hydro-carbonates) are inviſible elaſtic gaſes of a ſtrong diſagreeable ſmell, irreſpirable and incapable of ſupporting combuſtion, inſoluble in water, burning with oxygen with a blue lambent flame, and producing carbonic acid gas and water. From their furniſhing charcoal, when decompoſed by melted ſulphur, and from the products of their combuſtion, they evidently contain oxygen. There are different ſpecies of hydro-carbonates depending on the proportion of their conſtituents, which, from their ſpecific gravities, are commonly diſtinguiſhed into heavy and light hydro-carbonates.

239. The light hydro-carbonous oxides are obtained by the diſ-

tillation of wet charcoal, or by tranſmitting the vapour of alcohol through an ignited tube: ſpecific gravity 0.00059 to 0.00064. The heavy hydro-carbonous oxides are obtained, by diſtillation from camphor, ether, animal and vegetable ſubſtances, and by collecting the gas of marſhes: ſpecific gravity 0.00080 to 0.00082. The latter contain more carbon, require more oxygen for their decompoſition, and furniſh a larger proportion of carbonic acid gas, and leſs water than the former.

240. *Alcohol* is a tranſparent colourleſs liquid, of an agreeable penetrating ſmell, and pungent burning taſte: ſpecific gravity 0.8. It remains fluid in the greateſt natural or artificial cold. It boils at 176°, and in vacuum at 56°. Alcohol unites with water in every proportion. During the combination, caloric is evolved, and the ſpecific gravity of the compound is greater than the mean of thoſe of the components. Alcohol diſſolves about 60 of ſulphur, when they are preſented to each other in the ſtate of vapour. It alſo diſſolves a little phoſphorus. Theſe ſolutions are decompoſed by water. It diſſolves the boracic and carbonic acids, ammonia, ſoda, and potaſs, and is the means employed to obtain the two laſt in a ſtate of purity. Its action on the ſalts is various. It diſſolves the volatile oils, reſins, ſoaps, balſams, camphor, ſugar, tannin, extractive, and in part the gummy reſins. Alcohol is very inflammable, and when kindled it burns entirely away with a blue flame without ſmoke. The products of its combuſtion are carbonic acid and water. It is alſo decompoſed by being tranſmitted in the ſtate of vapour through a red-hot porcelain tube; by being heated with the fixed alkalies; and by the action of the ſulphuric, nitric, oxy-muriatic and acetic acids. From Lavoiſier's experiment on the combuſtion of alcohol, it was found by calculation to conſiſt of 51.72 oxygen, 29.88 charcoal, and 18.40 hydrogen; but by correcting the calculation according to Morveau's experiments, proving the compoſition of charcoal, from the ſame experiment alcohol would ſeem to conſiſt of 65.05 oxygen, 18.22 carbon, and 16.73 hydrogen. *Officinal.*

241. *Ether* is a tranſparent colourleſs fluid, of a very fragrant odour, and hot pungent taſte: ſpecific gravity 0.758. It freezes and cryſtallizes at —46°. It boils at 98°, and in vacuum at —20°. It is very ſoluble in air, and during its evaporation it produces an intenſe degree of cold. It is ſoluble in ten parts of water, and in alcohol in every proportion. It diſſolves a ſmall portion of phoſphorus, and the ſolution is decompoſed by alcohol. It abſorbs nitrous gas, combines with ammonia, and diſſolves the volatile oils, reſins, and caoutchouc. Ether is extremely inflammable, and burns with a white flame. Its vapour explodes when kindled in contact with oxygen gas. It is decompoſed by ſulphuric acid, oxy-muriatic acid gas, and by being tranſmitted through a red-hot

porcelain tube. Its conſtituents are oxygen, carbon, and hydrogen, the proportions not aſcertained. *Officinal.*

242. *Fixed oils* are tranſparent, more or leſs coloured, ſomewhat viſcid, inodorous fluids, having a mild taſte and unctuous feel. In the different ſpecies the ſpecific gravity varies from 0.9403 to 0.9153. The point of congelation alſo differs conſiderably, but in general it is within the range of the ordinary temperatures of the atmoſphere. Their boiling point exceeds 600°, and by being converted into vapour, they become empyreumatic. Fixed oils do not ſeem capable of combining with charcoal, but are freed from impurities, by being filtered through hot charcoal. When aſſiſted by heat, they diſſolve ſulphur and phoſphorus. They may be blended with ſugar and gum by trituration as in emulſions, and they diſſolve the volatile oils, and reſins, and gummy reſins. With the alkalies and earths they form ſoaps, and with metallic oxides plaſters. They are not ſoluble in water or in alcohol. They unite readily with oxygen, which renders them concreſcible. Thoſe oils which dry without loſing their tranſparency, as linſeed oil, are termed drying oils, in contradiſtinction to the fat oils which from expoſure become white, opaque and thick, and remain greaſy, ſuch as oil of olives or of almonds. When they become rancid, they undergo a farther degree of decompoſition, and are found to contain ſebacic acid. Oil in the ſtate of vapour is inflammable, and burns with a white flame. When the combuſtion is complete, the products are carbonic acid gas and water, but in general ſoot is depoſited. The ſulphuric acid renders the fixed oils brown and thick, and converts them into water and charcoal. The nitric acid oxygenizes them. The oxygenized muriatic acid blanches them, and renders them concrete like tallow or wax. The oils oxidize ſeveral of the metals, and are oxidized by ſeveral of their oxides. From Lavoiſier's experiment on the combuſtion of olive oil, its conſtituent principles were eſtimated at 79 charcoal and 21 hydrogen; but by correction they appear to be 50.39 carbon, 20.23 hydrogen, and 29.38 oxygen. *Officinal.* Oil of almonds, of caſtor, of linſeed, of olives, of muſtard, cacoa butter.

243. *Fat* and *tallow* ſcarcely differ from the fixed oils, except in being more concrete and more diſpoſed to rancidity. Fat melts between 92° and 127°. Tallow is ſtill leſs fuſible. They cannot be converted into vapour without ſuffering decompoſition, and, when melted, leave, like oil, a greaſy ſtain on paper. *Officinal.* Mutton ſuet, axunge.

244. *Wax* is a ſolid, of conſiderable conſiſtence, granulated and cryſtalline in its fracture, of a white colour, and without any remarkable odour or taſte. It ſoftens and becomes plaſtic when very ſlightly heated; at 142° it melts; at a higher temperature it is in part vaporized and decompoſed, and its vapour is inflammable,

It reſiſts in a remarkable degree the action of the acids; but in moſt of its other properties it reſembles the fixed oils. From its combuſtion it appears to conſiſt of carbon 53.12, hydrogen 16.91, and oxygen 29.97; or, according to the former calculation, of 82.28 charcoal, and 17.72 hydrogen. *Officinal.*

245. *Spermaceti* may be obtained cryſtallized in white argentine plates, of an unctuous feel and taſte, and a vapid ſmell. It melts between 90° and 95°, and at a higher temperature may be ſublimed almoſt unchanged. Its vapour is inflammable, and its flame is bright, clear, and without ſmell. By expoſure to air it becomes rancid. It is ſoluble, eſpecially by the aſſiſtance of heat, in alcohol and in ether. In its other properties it agrees with the fixed oils, with which it unites very readily by fuſion. Muſcular fleſh by long maceration in water is converted into a ſubſtance very analogous to ſpermaceti, but more fuſible, melting at 82°; and biliary calculi often conſiſt of another, which is much leſs fuſible, requiring a heat of 192° for its fuſion. For all theſe varieties, Fourcroy has propoſed the generic name *Adipocere*. *Officinal.* Spermaceti.

246. *Soaps* are combinations of the fluid or concrete fixed oils with alkalies, earths, or metallic oxides. The alkaline ſoaps have an unpleaſant taſte and peculiar ſmell, form a milky ſolution with water, and a tranſparent one with alcohol, and are powerfully detergent. White ſoap is made of ſoda and olive oil or tallow. Brown ſoap contains alſo reſin. Soft ſoap conſiſts of potaſs and whale oil: The white ſpots in it are from the addition of a little tallow. The volatile liniment of the pharmacopeias is a ſoap of ammonia and olive oil. The alkaline ſoaps are decompoſed by all the earthy ſalts. The alkali of the ſoap combines with the acid of the ſalts, and an earthy ſoap is formed from the union of the earth and oil. The earthy ſoaps are inſoluble in water. The alkaline ſoaps are decompoſed in the ſame way by the metallic ſalts. The metallic ſoaps are alſo inſoluble in water: many of them are ſoluble in oil, and ſome of them in alcohol. *Officinal.* Soaps of ſoda and ammonia.

247. *Plaſters* are alſo combinations of oil with metallic oxides. They are prepared by their immediate action on each other. Olive oil and litharge are moſt commonly employed. *Officinal.* Litharge plaſter.

248. *Volatile oils* differ from the fixed oils moſt remarkably in being vaporized unchanged by a heat under 212°; by evaporating completely without leaving a ſtain on paper; by being ſapid, often pungent, and odorous; and by being ſoluble in alcohol, and to a certain degree in water. They are more inflammable than the fixed oils, and burn with a large white flame, emit a great deal of ſmoke, and require more oxygen for their combuſtion. By expoſure to air they become coloured and thick, and are at laſt convert-

ed into an almoſt inodorous reſin. They are alſo oxidized and converted into reſins by muriate of mercury, and muriate of antimony; the acids act on them with great violence, and are even capable of inflaming them. On the other hand, they reſiſt conſiderably the action of the alkalies. In their other general properties they agree with the fixed oils, from which they ſeem to differ in compoſition, only in containing a larger proportion of hydrogen. In other reſpects, theſe oils are infinitely varied, eſpecially in their taſte and odour. Some are as limped as water, others are viſcid, others congeal on a ſlight diminution of temperature, and are even naturally concrete, and others are capable of forming cryſtallizations. Their predominant colours are the different ſhades of yellow and red, but there are alſo blue, green, and glaucous eſſential oils. Their ſpecific gravity varies from 0.8697 to 1.0439. *Officinal.* Oil of aniſe, cajeput, caraway, fennel, juniper, lavender, mace, origanum, pennyroyal, peppermint, pimento, roſemary, rue, ſaſſafras, ſavin, ſpearmint, turpentine, cloves, and all aromatic or odorous ſubſtances. *Empyreumatic oils*, oil of amber, of hartſhorn, of petroleum.

249. *Reſins* are concrete ſubſtances, poſſeſſing a certain degree of tranſparency, and are generally of an amber or browniſh-red colour. Their texture is homogenous, and their fracture vitreous. They are eaſily reduced to powder, which readily agglutinates. Their ſpecific gravity varies from 1.0452 to 1.2289. They have little taſte or ſmell. They are electrics. Expoſed to a certain degree of heat, they melt without ſuffering alteration, but they are decompoſed when converted into vapour. Their vapour is inflammable, and burns with a large ſtrong flame and a great deal of ſoot. Reſins unite by fuſion with ſulphur, difficultly with phoſphorus. They are ſoluble in alcohol, the fixed and the volatile oils, alkalies, and in nitric acid with evolution of nitric oxide gas. They are inſoluble in water, and are not acted upon by metallic oxides. *Officinal.* Pine reſins, dragons blood, guaiac, balſams of Peru, Tolu, Gilead, and Canada, turpentine, benzoin, ſtorax, olibanum, tacamahac, maſtiche, ſandarac, elemi.

Amber, copal, and about one fifth of ſandarac differ from the reſins in not being ſoluble in alcohol without particular management.

250. *Camphor* is a concrete friable ſubſtance, of a white colour, with a conſiderable degree of tranſparency, and a cryſtalline appearance, ſpecific gravity 0.9887. Its taſte is bitter and acrid, and its ſmell penetrating and peculiar. It is evaporated unchanged by a heat of 145°, but may be melted by ſuddenly expoſing it to 302°. The vapour when condenſed cryſtallizes in hexagonal plates. Its vapour is exceedingly inflammable, and when kindled it burns with a very white flame and a great deal of ſmoke, and leaves no reſiduum. The products of its combuſtion are carbonic acid gas, charcoal, and water. Camphor is ſoluble in alcohol and

in the acids. From theſe ſolutions it is precipitated by water. It is alſo ſoluble in hot oils, both volatile and fixed, but on cooling ſeparates from them in plumoſe cryſtals. It is inſoluble in water, and is not acted on by the alkalies, metals or metalic oxides. By repeated diſtillation with nitric acid, it is converted into a peculiar acid. It exiſts in many vegetables, but is chiefly procured from the laurus camphora. *Officinal.*

251. *Starch* is a fine white powder, generally concreted in friable hexagonal columns, ſmooth to the feel, and emitting a particular ſound when compreſſed. It has neither taſte nor ſmell. It is decompoſed by heat. It is not ſoluble in cold water or in alcohol. Warm water converts it into a kind of paſte, which on cooling aſſumes a gelatinous form. This jelly when dried by heat becomes tranſparent and brittle like gum, but is not ſoluble in cold water. Starch, after being thus diſſolved in hot water, cannot be reduced to its original ſtate. It is precipitated by infuſion of galls, (Dr. Thomſon.) *Officinal.* Wheat, ſtarch, flour, barley, oats.

252. *Sugar* is a hard, but brittle ſubſtance, of a white colour, diſpoſed to form ſemi-tranſparent cryſtallizations, of a ſweet taſte, and without ſmell. When heated ſufficiently it melts, is decompoſed, emits a peculiar ſmell (caromel), and becomes inflamed. Sugar at 40° is ſoluble in its own weight of water, and in ſtill leſs at 212°. It is alſo ſoluble in about four parts of boiling alcohol. It combines with volatile oils, and renders them miſcible with water. It alſo unites with potaſs and lime. It is decompoſed by the concentrated ſulphuric and nitric acids. According to Lavoiſier's experiments, it conſiſts of 71.76 oxygen, 17.89 carbon, and 10.35 hydrogen; or, according to the original calculation, of 64 oxygen, 28 charcoal, and 8 hydrogen. *Officinal.* Sugar, honey, manna. Subſtances containing ſugar, liquorice, ſarcocoll, logwood, figs, raiſins, currants, caſſia fiſtula, prunes.

253. *Jelly* is contained in the juices of acid fruits. It is depoſited from them in the form of a ſoft tremulous maſs, almoſt colourleſs, and agreeable to the taſte. It is ſcarcely ſoluble in cold water, but very ſoluble in hot water; and when the ſolution cools, it again aſſumes a gletanious form. With ſugar its combination is well known. By long boiling it loſes this property of congealing. When dried, it becomes tranſparent, hard, and brittle, reſembling gum. It combines with the alkalies, and is converted by the nitric acid into oxalic acid. *Officinal.* Acidulous fruits.

254. *Tannin*, when completely dried, is a brittle ſubſtance, of a black colour, and vitreous fracture; it is ſoluble in alcohol; it is much more ſoluble in hot than in cold water. The ſolution has a dark-brown colour, aſtringent taſte, and peculiar ſmell; it is precipitated by acids, in the form of a viſcid fluid, like pitch; it

is alſo precipitated by carbonate of potaſs in yellow flakes; it forms an inſoluble elaſtic precipitate with gelatin, and dark blue or black precipitates with iron. *Officinal.* Galls, uva urſi, tormentil, rhubarb, ſarſaparilla, St. Lucie cinchona, ſwietenia, ſimarouba, filix mas, kino, catechu, ſalix.

QUATERNARY OXIDES, (236).

255. *Gum*, when pure, is tranſparent and colourleſs, eaſily reduced to powder; without ſmell, and of a ſlightly-ſweetiſh taſte. It is very ſoluble in water, and its ſolution is glutinous. The ſolution of gum in water conſtitutes mucilage; it is thick and adheſive, and ſoon dries when expoſed to the air. Gum is alſo ſoluble in the weak acids; but is totally inſoluble in alcohol, which even precipitates it from mucilage. When triturated with a ſmall quantity of oil or reſin, it renders them miſcible with water. Gum is very little diſpoſed to ſpontaneous decompoſition: even mucilage may be kept for many years without change; but it is decompoſed by the ſtrong acids, and is precipitated by ſilicigid potaſs. By oxygenizement with nitric acid, it forms ſucceſsively, mucous, malic, and oxalic, acid; with oxy-muriatic acid it forms citric acid. When expoſed to heat, it does not melt, but ſoftens, ſwells, and becomes charred and incinerated. Its products are carbonic acid, and carburetted hydrogen gas, empyreumatic oil, and a conſiderable quantity of acetous acid, combined with a little ammonia. Fourcroy and Vauquelin ſay it conſiſts of 65.38 oxygen, 23.08 carbon, and 11.54 hydrogen. Cruickſhanks has however demonſtrated, that it contains nitrogen and lime, and has rendered it probable that it differs from ſugar in containing more carbon and leſs oxygen. *Officinal.* Gum Arabic, linſeed, quinceſeed.

256. *Tragacanth* is opaque and white, difficultly pulverizable, not ſweetiſh, very ſparingly ſoluble in water, but abſorbing and forming a paſte with a large quantity. Its ſolution is adheſive, but cannot be drawn out into threads. It moulds readily and acquires a fetid ſmell. It is precipitated by nitrate of mercury. It is inſoluble in alcohol, and ſeems to contain more nitrogen and lime than gum does. *Officinal.* Tragacanth.

257. *Extractive* is ſoluble in water, eſpecially when hot, and in alcohol; it is alſo ſoluble in the weak acids, but is inſoluble in ether. It attracts moiſture from the atmoſphere; and when diſſolved in water, it abſorbs oxygen, and becomes inſoluble in water; it is alſo altered and precipitated by oxy-muriatic acid; it has a ſtrong affinity for alumina, and decompoſes ſeveral metallic ſalts. It is found in almoſt all plants, but can ſcarcely be procured ſeparate, ſo that its characters are not well aſcertained. *Officinal.* Saffron, aloes.

258. *Gum-reſins,* in ſtrict propriety, ſhould not be noticed here, as they are ſecondary compounds, and probably vary much in their nature. They ſeem to be compounds of reſin with extractive and eſſential oil, and perhaps other immediate principles, not yet aſcertained. *Officinal.* Gum Ammoniac, galbanum, ſcammony, aſſafœtida, gamboge, myrrh, ſagapenum, olibanum.

259. *Bitter principle,* (Thomſon), intenſely bitter, of a yellowiſh colour, ductile while ſoft, brittle when dry, not fuſible, ſoluble in alcohol and in water, not cryſtallizable, precipitated by nitrate of ſilver, acetate of lead. *Officinal.* Quaſſia, gentian, colocynth, broom, ſimarouba, dandelion, colomba, marſh trefoil, leſſer centaury, bleſſed thiſtle, different ſpecies of artemiſia, cinchona jamaicenſis.

260. *Narcotic principle,* cryſtallizable, ſoluble in about 400 parts of boiling water, ſoluble in cold water, ſoluble in 24 parts of boiling alcohol, ſoluble in hot ether, in all acids, and in hot volatile oils, fuſible, not volatile, highly narcotic. *Officinal.* Opium, lactuca, bellodonna, hyoſciamus, hemlock, ſtramonium.

261. *Acrid principle,* ſoluble in alcohol, water, acids and alkalies, riſes in diſtillation with water and alcohol, volatile, not neutralized by alkalies or acids. *Officinal.* Squils, garlic, colchiaum, aſcrum, arum, hellebore, bryony, iris, ranunculus, digitalis viola, ſcurvygraſs, muſtard.

262. *Chinconin,* not acrid, ſoluble in alcohol and in water, precipitated by infuſion of galls. *Officinal.* Chinchona officinalis, Colomba, Anguſtura, Ipecacuan. Dr. Thomſon diſcovered a principle, poſſeſſing ſimilar chemical properties in black pepper. I have ſince found it in capſicum, and it probably exiſts in other peppers.

263. *Indigo* has a deep blue colour, is light and friable, without taſte or ſmell, inſoluble in water, alcohol, ether, and oils, forming a deep blue ſolution with ſulphuric acid when precipitated from acids; ſoluble in alkalies, becoming green. It is obtained from the indigofera tinctoria, and ioatis tinctoria.

264. *Caoutchouc,* when ſmoke has not been employed in drying it, is of a white colour, ſoft, pliable, extremely elaſtic, and difficultly torn; ſpecific gravity 0.9335; inalterable by expoſure to air; inſoluble in water, but ſoftened, ſo that its edges may be made to adhere to each other; inſoluble in alcohol; ſoluble, without alteration, in ether waſhed with water, and in rectified petroleum; ſoluble in volatile oils; and fuſible by heat, but altered, ſo that it remains glutinous after evaporation and cooling; inflammable; inſoluble in alkalies, and decompoſed by the ſtrong acids. Its decompoſition proves that it conſiſts of carbon, hydrogen, nitrogen, and oxygen. It is obtained principally from Hævea caoutchouc

and Jatropha elaſtica in South America, and the Ficus Indica, Artocarpus integrifolia, and Urceola elaſtica in the Eaſt Indies.

265. *Suber* conſtitutes the epidermis of all vegetables. On the quercus ſuber it is thickened by art in a ſurpriſing degree, and forms common cork. It is a light elaſtic ſubſtance, very inflammable, burning with a bright white flame, and leaving a very ſpongy charcoal; it is not ſoluble in any menſtruum; it is decompoſed by nitric acid, and is converted into a peculiar acid, and an unctuous ſubſtance.

266. *Wood*, (Lignin ?) when ſeparated from all the other matters with which it is combined in vegetables, is a pulverulent, fibrous, or lamellated body, more or leſs coloured, of conſiderable weight, without taſte or ſmell, and inſoluble in water or alcohol. When expoſed to ſufficient heat, it is decompoſed without melting or ſwelling, and is converted into charcoal without any change of form. Its products, by combuſtion, are carbonic acid, and carburetted hydrogen gas, water, empyreumatic oil, and acetous acid. By nitric acid, it is changed into the malic, oxalic, and acetous acids. It forms, as it were, the ſkeleton of all vegetables.

267. *Gelatin*, when exſiccated, is a hard, elaſtic, ſemi-tranſparent ſubſtance, reſembling horn, having a vitreous fracture: inalterable in the air, ſoluble in boiling water, and forming with it a gelatinous maſs on cooling; it is alſo ſoluble, but leſs readily, in cold water. It is completely inſoluble in alcohol, and is even precipitated by it from its ſolution in water; it is ſoluble in acids, even when much diluted, and alſo in the alkalies; but its moſt characteriſtic property is its affinity for tannin, with which it forms a thick, yellow precipitate, which ſoon concretes into an adheſive, elaſtic maſs, readily drying in the air, and forming a brittle ſubſtance, of a reſinous appearance, exactly reſembling overtanned leather. It is alſo precipitated copiouſly by carbonate of potaſs. The ſolution of gelatin in water, firſt becomes acid, and afterwards putrid. When decompoſed by nitric acid or heat, its products ſhew that it contains only a ſmall proportion of nitrogen. It is principally contained in the cellular, membranous, and tendinous parts of animals, and forms an important article of nouriſhment. Glue and iſinglaſs, which are much employed in the arts, are almoſt pure gelatin. *Officinal.* Iſinglaſs, Cornu cervi.

268 *Albumen* is a brittle, tranſparent ſubſtance, of a pale yellow colour, and glutinous taſte, without ſmell, readily ſoluble in cold water, inſoluble in boiling water, but ſoftened and rendered opaque and white when thrown into it; inſoluble, and retaining its tranſparency in alcohol; ſwelling; becoming brown, and decrepitating when ſuddenly expoſed to heat. It generally exiſts in the form of a viſcid, tranſparent fluid, having little taſte or ſmell, and readily

ſoluble in cold water. When expoſed to a temperature of 165°, it coagulates into a white opaque maſs, of conſiderable conſiſtency; it is alſo coagulated by alcohol and acids. Albumen forms with tannin a yellow precipitate, inſoluble in water. *Coagulated albumen* is not ſoluble either in cold or in boiling water. It is ſoluble, but with decompoſition, in the alkalies and alkaline earths. It is alſo ſoluble in the acids, greatly diluted, but may be precipitated from them by tannin. When ſlowly dried, it becomes brittle, tranſparent and of a yellow colour, reſembling amber. When decompoſed by nitric acid or heat, it is found to contain more nitrogen than gelatin does. White of egg conſiſts of albumen, combined with a very little ſoda, ſulphur, and phoſphate of lime. Albumen alſo forms a large proportion of the ſerum of the blood, and is found in the ſap of vegetables. It is highly nutritious.

269. *Fibrin* is of a white colour, without taſte or ſmell, tough and elaſtic, but when dried, hard and almoſt brittle. It is not ſoluble in water or in alcohol. The concentrated cauſtic alkalies form with it a kind of fluid viſcid ſoap. It is diſſolved even by the weak and diluted acids; but it undergoes ſome change, by which it acquires the properties of jellying, and being ſoluble in hot water. By maceration in water, it becomes putrid, and is converted into adipocere (242). By long boiling in water, it is rendered tough and corneous. When decompoſed by heat or nitric acid, it is found to contain a large proportion of nitrogen. It forms the baſis of the muſcular fibre, and is contained in ſmall quantity in the blood. The gluten of wheat does not ſeem to differ from it in any important property. It is eminently nutritious.

270. *Urea* is obtained in the form of brilliant micaceous cryſtals, in groups, forming a maſs of a yellowiſh white colour, adhering to the veſſel containing it; difficult to cut or break; hard and granulated in its centre, gradually becoming ſoft, and of the conſiſtence of honey on its ſurface; of a ſtrong, diſguſting, alliaceous odour; of an acrid, pungent, diſagreeable taſte. It is deliqueſcent; its ſolution cauſes a ſenſible diminution of temperature; it is alſo ſoluble in alcohol, eſpecially when aſſiſted by heat. On cooling, the alcoholic ſolution depoſits cryſtals of pure urea. By the application of heat it melts, ſwells rapidly, and at the ſame time begins to be decompoſed; emitting an inſupportably fetid odour, and is converted into carbonate of ammonia, and carburetted hydrogen gas. Urea is charred by concentrated ſulphuric acid; diluted ſulphuric acid aided by heat, is capable of converting it entirely into acetous acid and ammonia; concentrated nitrous acid decompoſes it with rapidity; diluted nitric acid aided by heat, changes it almoſt entirely into carbonic acid gas and nitrogen gas; muriatic acid diſſolves and preſerves it; oxy-muriatic acid converts it into ammonia and carbonic acid; potaſs aided by heat,

converts it into the carbonate and acetate of ammonia. It influences the form of the cryſtallization of the muriates of ammonia and ſoda. The ſolution of urea in water varies in colour from a deep brown to pale yellow, according to its quantity. With eight parts of water it is perfectly fluid; it ſcarcely undergoes ſpontaneous decompoſition when pure, but the addition of ſome albumen occaſions it to putrefy rapidly. By repeated diſtillation it is completely converted into carbonate of ammonia. With nitric acid it forms a pearly cryſtalline precipitate; it alſo forms precipitates with the nitrates of lead, mercury, and ſilver. It is not precipitated by tannin or gallic acid. Urea is only obtained from urine by evaporating the ſolution of a thick extract of urine in alcohol.

COMPOUND ACIDS.

271. The compound acids poſſeſs the properties of acids in general (194); but they are diſtinguiſhed from the acids with ſimple baſes, by their great alterability.

272. The ternary acids coincide nearly with the vegetable acids, and are characterized by their being converted entirely into water and carbonic acid when completely decompoſed by oxygen. They conſiſt of various proportions of carbon, hydrogen, and oxygen.

273. The quaternary acids coincide nearly with the animal acids; and are characterized by their furniſhing ammonia as well as water and carbonic acid when decompoſed.

TERNARY ACIDS.

274. *Acetic acid* is a tranſparent and colourleſs fluid, of an extremely pungent ſmell and a cauſtic acid taſte, capable of reddening and bliſtering the ſkin. It is very volatile, and its vapour is highly inflammable; it combines with water in every proportion; it combines with ſugar, mucilage, volatile oils, alcohol; it diſſolves boracic acid, and abſorbs carbonic acid gas; it is formed by the acidification of ſugar, and by the decompoſition of ſome other ternary and quaternary compounds by heat or acids. It is decompoſed by the ſulphuric and nitric acids, and by heat. The proportions of its conſtituents are not aſcertained. In its ordinary ſtate, it has only an acid taſte, a pleaſant odour, ſpecific gravity 1.0005, congeals and cryſtallizes at—22°, and is vaporized at 212. *Officinal.*

275. *Acetates* are very ſoluble in water; are decompoſed by heat, by expoſure of their ſolutions to the air, and by the ſtronger acids. *Officinal.* Acetate of potaſs, lead, mercury.

276. *Oxalic acid* is obtained in quadrangular cryſtals, tranſparent

and colourleſs, of a very acid taſte. They are ſoluble in their own weight of water at 212°, and in about two waters at 65°. Boiling alcohol diſſolves ſomewhat more than half its weight, and at an ordinary temperature a little more than one-third. It is ſoluble in the muriatic and acetous acids. It is decompoſed by heat, ſulphuric acid, and nitric acid. According to Fourcroy, it conſiſts of 77 oxygen, 13 carbon, and 10 hydrogen.

277. *Oxalates* are decompoſed by heat; form a white precipitate with lime water, which is ſoluble in acetous acid after being expoſed to a red heat. The earthy oxalates are very ſparingly ſoluble in water; the alkaline oxalates are capable of combining with exceſs of acid, and become leſs ſoluble.

278. *Tartaric acid* varies in the forms of its cryſtals; its ſpecific gravity is 1.5962; it is permanent in the air; it is decompoſed by heat; it diſſolves readily in water, and the ſolution is not decompoſed by expoſure, unleſs very dilute; it may be changed by nitric acid into oxalic acid. According to Fourcroy it conſiſts of 70.5 oxygen, 19.0 carbon, and 10.5 hydrogen. *Officinal.* Exiſts in tamarinds, grapes, &c.

279. *Tartrates*, by a red heat, are converted into carbonates. The earthy tartrates are ſcarcely ſoluble in water: the alkaline tartrates are ſoluble; but when combined with exceſs of acid, they become much leſs ſoluble. The tartaric acid is capable of combining at the ſame time with two baſes. When tartrates are digeſted in ſulphuric acid, the tartaric acid is ſeparated, and is recognized by forming a gritty precipitate with a ſolution of potaſs. *Officinal.* Super tartrate of potaſs, tartrate of potaſs and ſoda.

280. *Citric acid* cryſtallizes in rhomboidal priſms, which ſuffer no change from expoſure to the air, and have an exceedingly acid taſte. When ſufficiently heated, they melt, ſwell, and emit fumes, and are partly ſublimed unchanged, and partly decompoſed. Water, at ordinary temperatures, diſſolves $\frac{1}{2}$ of its weight of theſe cryſtals, and at 212° twice its weight. The ſolution undergoes ſpontaneous decompoſition very ſlowly. Sulphuric acid chars it, and forms vinegar. Nitric acid converts it into oxalic and acetous acids. *Officinal.* Orange and lemon juice, hips, &c.

281. *Citrates* are decompoſed by the ſtronger mineral acids, and alſo by the oxalic and tartarous, which form an inſoluble precipitate in their ſolutions. The alkaline citrates are decompoſed by a ſolution of barytes.

282. *Malic acid* is a viſcid fluid, incapable of cryſtallization, of a reddiſh-brown colour, and very acid taſte. It exiſts in the juice of apples, and combined with lime in that of the common houſeleek. It forms precipitates in the ſolution of the nitrates of mer-

cury, lead, and ſilver. *Officinal.* Barberry, plumb, ſloe, elder, &c.

283. *Malates* having alkalies for their baſe, are deliqueſcent. The acidulous malate of lime is ſoluble in cold water.

284. *Lactic acid* is incapable of cryſtallizing, and is deliqueſcent.

285. *Lactates* are deliqueſcent, and ſoluble in alcohol.

286. *Gallic acid* cryſtallizes in brilliant colourleſs plates, of an acid and ſomewhat auſtere taſte, and of a peculiar odour when heated. It may be ſublimed without alteration, although a ſtrong heat decompoſes it in part. It is not altered by expoſure to the air, is ſoluble in 1½ of water at 212°, and in 12 waters at 60°, and in four times its weight of alcohol. It has a ſtrong affinity for metallic oxides, eſpecially iron. It precipitates gold, copper, and ſilver brown, mercury orange, iron black, biſmuth yellow, and lead white. *Officinal.* It exiſts in nut-galls, and in moſt aſtringent vegetable ſubſtances.

287. *Gallates* have not been examined.

288. *Mucous acid* is a white gritty powder, of a ſlightly acid taſte, ſoluble in 80 times its weight of boiling water.

289. *Mucites* of potaſs and ſoda are cryſtallizible. Mucites with earthy and metallic baſes are nearly inſoluble.

290. *Benzoic acid* cryſtallizes in compreſſed priſms of a pungent taſte and aromatic ſmell. It is fuſible, and evaporates by heat, for the moſt part, without change. When brought in contact with flame, it catches fire, and leaves no reſiduum. It is permanent in the air. It is very ſparingly ſoluble in cold water; but at 212° it diſſolves in about 24 waters. It is alſo ſoluble, in hot acetous acid It is ſoluble, without change, in alcohol, in concentrated ſulphuric and nitric acids, and is ſeparated from them by water. *Officinal.* In balſam of Tolu, of Peru, benzoin, ſtorax, &c.

291. *Benzoates*, little known, but generally forming feather-ſhaped cryſtals, and ſoluble in water.

292. *Succinic acid* cryſtallizes in tranſparent white triangular priſms; may be melted and ſublimed, but ſuffers partial decompoſition; more ſoluble in hot that in cold water; ſoluble in hot alcohol. *Officinal.*

293. *Succinates* little known.

294. *Camphoric acid* cryſtallizes in white parallelopipeds of a ſlightly acid bitter taſte, and ſmell of ſaffron, efflorefcing in the air; ſparingly ſoluble in cold water; more ſoluble in hot water; ſoluble in alcohol, the mineral acids, volatile and unctuous oils; melting and ſubliming by heat.

295. *Camphorates* have commonly a bitter taſte, burn with a

blue flame before the blowpipe, and are decompoſed by heat, the acid ſubliming.

296. *Suberic acid* is not cryſtallizable, but is obtained either in the form of thin pellicles, or of a powder. At 60° it requires 140 times its weight of water for its ſolution; at 212° only twice its weight. When heated, it firſt melts, then becomes pulverulent, and at laſt ſublimes. It changes the blue colour of a ſolution of indigo in ſulphuric acid, of the nitrate of copper, and of the ſulphate of copper to green, and gives a yellow colour to the green ſulphate of iron, and to the ſulphate of zinc.

297. *Suberates* have in general a bitter taſte, and are decompoſed by heat.

298. *Laccic acid* is obtained in the form of a reddiſh liquor, having a ſlightly bitter ſaltiſh taſte, and the ſmell of new bread, by expreſſion from the white lac of Madras; but on evaporation it aſſumes the form of acicular cryſtals. It riſes in diſtillation. It decompoſes with efflореſcence the carbonates of lime and ſoda. It renders the nitrate and muriate of barytes turbid. It aſſumes a green colour with lime water, and a purpliſh colour with ſulphate of iron; and precipitates ſulphuret of lime white; tincture of galls green, acetite of lead reddiſh, nitrate of mercury whitiſh, and tartrite of potaſs in the ſame way as tartarous acid does; except that the precipitate is not ſoluble in potaſs.

299. *Laccate* of lime bitteriſh, of ſoda deliqueſcent.

300. *Sebacic acid* has no ſmell, and a ſlightly acid taſte. It is cryſtallizable, melts like fat, and is not volatile. It is ſo ſoluble in hot water as to become ſolid on refrigeration. It is alſo very ſoluble in alcohol. It precipitates the nitrates of lead, ſilver, and mercury, and the acetites of lead and mercury. It does not precipitate the waters of lime, baryta, or ſtrontia.

301. *Sebates* are ſoluble ſalts.

QUATERNARY ACIDS.

302. *Pruſſic acid* is a colourleſs fluid, of a ſtrong ſmell, like that of peach flowers or bitter almonds, and a ſweetiſh pungent taſte. It does not redden vegetable blues, and unites difficultly with the alkalies and earths. It is eaſily decompoſed by light, heat, or oxygenized muriatic acid. It does not act upon the metals, but forms coloured and generally inſoluble combinations with their oxides. It has a great tendency to form triple ſalts with alkaline and metallic baſes. It is obtained from animal ſubſtances by the action of heat, nitric acid, fixed alkalies, and putrefaction. *Officinal.* Bitter almonds. Prunus Lauro ceraſus.

303. *Pruſſiates* of alkalies are eaſily decompoſed even by carbo-

nic acid. They form variouſly-coloured precipitates in the ſolutions of the metallic ſalts, except thoſe of platinum.

304. *Amnic acid* is obtained in white, brilliant, acicular cryſtals, of an acid taſte, reddening the tincture of turnſol, ſparingly ſoluble in cold water, but ſomewhat more ſoluble in hot water. It is ſoluble in alcohol. It is decompoſed by heat.

305. *Amnates.* Very ſoluble in water, and the acid is precipitated from them in the form of a white cryſtalline powder, by the other acids.

306. *Uric acid* is obtained in the form of acicular brilliant cryſtals, of a pale yellow colour, almoſt inſoluble in cold, and very ſparingly ſoluble in boiling water, but becoming very ſoluble when combined with an exceſs of potaſs or ſoda. It is decompoſed at a high temperature, and furniſhes carbonate of ammonia, and carbonic acid, with very little oil or water, and leaves a charcoal which contains neither lime nor alkali. It is alſo decompoſed by the nitric and oxygenized muriatic acids.

307. The *urates* are almoſt inſoluble in water. The ſub-urates of ſoda and potaſs are very ſoluble, and the uric acid is precipitated from their ſolutions even by the carbonic acid.

Characters of Salts derived from their Bases.

CLASS FIRST. Alkaline ſalts, ſoluble in water, not precipitated by potaſs or oxalic acid.

Genus I. *Potaſs.* Sapid, bitter, cryſtallizable, fuſible, calcinable, vitrified or reduced to their baſe by heat, decompoſed in general by baryta, rarely by lime. *Officinal.* Sulphate, nitrate, carbonate, ſuper-tartrate, tartrate, acetate.

G. II. *Soda.* Sapid, bitter, cryſtallizable, commonly containing much water of cryſtallization, and therefore efloreſcent, and undergoing the watery fuſion and exſiccation before they are melted by the fire, decompoſed by baryta and potaſs. *Officinal.* Sulphate, muriate, phoſphate, carbonate, tartrate, ſub-borate.

G. III. *Ammonia.* Sapid, acrid, very ſoluble, either ſublimed, unchanged, or decompoſed, loſing their baſe partially or totally by heat, baſe alſo expelled by baryta, potaſs, ſoda, ſtrontia, and lime. *Officinal.* Muriate, carbonate, acetate.

CLASS SECOND. *Earthy ſalts.* Either inſoluble in water, or if ſoluble, precipitated by ſulphuric acid, and carbonate of potaſs.

G. I. *Baryta.* Generally inſoluble in water, and indecompoſable by fire, all poiſonous and decompoſed by the alkaline carbonates. *Officinal.* Sulphate, carbonate, and muriate.

G. II. *Strontia.* Generally inſoluble in water, and indecompoſable by fire, not poiſonous, and decompoſed by the alkaline carbonates, potaſs, ſoda, and baryta.

G. III. *Lime.* Generally ſparingly ſoluble in water, decompoſed by the alkaline carbonates, potaſs, ſoda, baryta, and ſtrontia, and by oxalic acid. *Officinal.* Carbonate, muriate, phoſphate.

G. IV. *Magneſia.* Generally ſoluble in water, and bitter, decompoſed by baryta, potaſs, ſoda, ſtrontia, and partially by ammonia. Magneſian ſalts, when added to ammoniacal ſalts, containing the ſame acid, quickly depoſite cryſtals of a triple ammoniaco-magneſian ſalt. *Officinal.* Sulphate, carbonate.

G. V. *Glucine.* Taſte ſweetiſh, decompoſed by all the preceeding baſes; when recently precipitated by an alkali, ſoluble in carbonate of ammonia, precipitated by an infuſion of nut galls, and ſuccinate of potaſs.

G. VI. *Alumina.* Generally ſoluble in water, taſte ſweetiſh and ſtyptic, decompoſed by all the preceeding baſes; when recently precipitated ſoluble in the alkalies, and in ſulphuric acid, precipitated by hydro-ſulphuret of potaſs. *Officinal.* Super-ſulphate.

G. VII. *Yttria.* Sweetiſh ſtyptic taſte, decompoſed by all the preceding baſes, precipitated by pruſſiate of potaſs and iron, and by infuſion of galls.

G. VIII. *Zirconia.* Taſte auſtere, decompoſed by all the preceeding baſes, precipitate not ſoluble in the alkalies, and when rediſſolved in muriatic acid, precipitated by hydro-ſulphuret of potaſs, pruſſiate of potaſs and iron, and infuſion of galls.

G. IX. *Silica.* Forms only one ſalt with fluoric acid, which is cryſtallizable, ſoluble in exceſs of acid, and in the alkaline fluates.

CLASS THIRD. *Metalline ſalts.*

1. Soluble in water, precipitated by hydro-ſulphuret of potaſs.
2. Inſoluble in water, fuſible with borax into a coloured glaſs, or with charcoal into a metallic button.

G. I. *Gold.* Soluble in water, ſolution yellow, metal precipitated by ſulphate of iron, ſulphurous acid and infuſion of galls, pruſſiate of potaſs and iron gives a yellowiſh white and muriate of tin a purpliſh precipitate.

G. II. *Platinum.* Solution in water browniſh, not precipitated by pruſſiate of potaſs and iron, or infuſion of galls, coloured bright red by muriate of tin, metal precipitated by ſulphuretted hydrogen, precipitated orange by pruſſiate of mercury, and in ſmall red cryſtals by potaſs and ammonia.

G. III. *Silver.* Metal precipitated by copper and ſulphate of iron. Precipitated white by muriatic acid and the pruſſiates, black by hydro-ſulphuret of potaſs, and yellowiſh brown by infuſion of galls. *Officinal.* Nitrate.

G. IV. *Copper.* Soluble in water; ſolution blue or green, rendered bright blue by ammonia, metal precipitated by iron, precipitated black by hydro-ſulphuret of potaſs, greeniſh yellow by pruſſiate of potaſs and iron, and brown by oxallic acid. *Officinal.* Sulphate.

G. V. *Iron.* Soluble in water. Solution green or browniſh red; precipitated blue by the triple pruſſiates and purple, or black by infuſion of galls. *Officinal.* Sulphate, tartrate, acetate, carbonate.

G. VI. *Lead.* Inſoluble ſalts eaſily reduced. Soluble ſalts, colourleſs; precipitated white by triple pruſſiate infuſion of galls and zinc, and black by hydro-ſulphuret of potaſs. *Officinal.* Acetate, ſub-acetate.

G. VII. *Tin.* Soluble, not precipitated by infuſion of galls; precipitated white by triple pruſſiate and lead, black by hydro-ſulphuret of potaſs, and brown by ſulphuretted hydrogen.

G. VIII. *Zinc.* Soluble; colourleſs; not precipitated by any metal or infuſion of galls; precipitated white by alkalies, triple pruſſiate, hydro-ſulphuret of potaſs, and ſulphuretted hydrogen. *Officinal.* Sulphate.

G. IX. *Mercury.* Volatile; precipitate by copper metallic, by triple pruſſiate and muriatic acid, white, by hydro-ſulphuret of potaſs, black, and by infuſion of galls orange. *Officinal.* Muriate, ſub-muriate, ſub-ſulphate.

G. X. *Tellurium.* Not precipitated by triple pruſſiate. Precipitate by zinc black and metallic, by hydro-ſulphuret of potaſs brown, by infuſion of galls yellow, and by alkalies white, and ſoluble when the alkali is added in exceſs.

G. XI. *Antimony.* Precipitate by iron or zinc black, by hydro-ſulphuret of potaſs orange. *Officinal.* Muriate, phoſphate, tartrate.

G. XII. *Biſmuth.* Solution colourleſs. Precipitate by copper metallic, by water and triple pruſſiate white, by infuſion of galls orange, and by hydro-ſulphurets black.

G. XIII. *Manganeſe.* Soluble, not precipitated by gallic acid. Precipitate by alkalies, triple pruſſiate and hydro-ſulphurets white.

G. XIV. *Nickel.* Salts ſoluble; colour green; precipitate by triple pruſſiate dull green, by hydro-ſulphuret black, by infuſion of galls greyiſh white, and by iron, &c. metallic.

G. XV. *Cobalt.* Soluble reddiſh, precipitate by alkalies blue or reddiſh brown, by triple pruſſiate brown with a ſhade of blue.

G. XVI. *Uranium.* Soluble, yellow, precepitate by alkalies yellow, by alkaline carbonates white, ſoluble in exceſs of alkali, by triple pruſſiate browniſh red, by hydroſulphuret of potaſs browniſh yellow, and by infuſion of galls chocolate.

G. XVII. *Titanium.* Precipitate by alkaline carbonates flaky white, by triple pruſſiate and hydro-ſulphuret green, and by infuſion of galls reddiſh brown, ſolution coloured red by tin, and blue by zinc.

G. XVIII. *Chromum.* Precipitate by triple pruſſiate and hydro-ſulphuret green, and by infuſion of galls brown.

G. XIX. *Molybdenum.* Solutions blue, precipitate by triple pruſſiate and tincture of galls brown.

G. XX. *Tungsten.* Unknown.

G. XXI. *Arſenic.* Precipitate by water and triple pruſſiate white, by hydro-ſulphuret of potaſs yellow.

G. XXII. *Columbium.* Colourleſs; precipitate by alkaline carbonates and zinc white, by triple pruſſiate green, by hydro-ſulphuret of ammonia chocolate, and by tincture of galls orange.

SECT. II.

PHARMACEUTICAL OPERATIONS.

Collection and Preservation of Simples.

308. EACH of the kingdoms of nature furniſhes articles which are employed in medicine, either in their natural ſtate, or after they have been prepared by the art of pharmacy.

309. In collecting theſe, attention muſt be paid to ſelect ſuch as are moſt ſound and perfect, to ſeparate from them whatever is injured or decayed, and to free them from all foreign matters adhering to them.

310. Thoſe precautions muſt be taken which are beſt fitted for preſerving them. They muſt in general be defended from the effects of moiſture, too great heat, or cold, and confined air.

311. When their activity depends on volatile principles, they muſt be preſerved from the contact of the air as much as poſſible.

312. As the vegetable kingdom preſents us with the greateſt number of ſimples, and the ſubſtances belonging to it are the leaſt conſtant in their properties, and moſt ſubject to decay, it becomes neceſſary to give a few general rules for their collection and preſervation.

313. Vegetable matters ſhould be collected in the countries

where they are indigenous; and thoſe which grow wild, in dry ſoils, and high ſituations, fully expoſed to the air and ſun, are in general to be preferred to thoſe which are cultivated, or which grow in moiſt, low, ſhady, or confined places.

314. Roots which are annual, ſhould be collected before they ſhoot out their ſtalks or flowers; biennial roots in the harveſt of the firſt, or ſpring of the ſecond year; perennial roots either in ſpring before the ſap has begun to mount, or in harveſt, after it has returned.

315. Thoſe which are worm-eaten, except ſome reſinous roots, or which are decayed, are to be rejected. The others are immediately to be cleaned with a bruſh and cold water, letting them lie in it as ſhort time as poſſible; and the fibres and little roots, when not eſſential, are to be cut away.

316. Roots which conſiſt principally of fibres, and have but a ſmall tap, may be immediately dried. If they be juicy, and not aromatic, this may be done by heat, not exceeding 100° of Fahrenheit; but if aromatic, by ſimply expoſing them, and frequently turning them in a current of cold dry air: if very thick and ſtrong, they are to be ſplit or cut into ſlices, and ſtrung upon threads; if covered with a tough bark, they may be peeled freſh, and then dried. Such as loſe their virtues by drying, or are directed to be preſerved in a freſh ſtate, are to be kept buried in dry ſand.

317. No very general rule can be given for the collection of herbs and leaves, ſome of them acquiring activity from their age, and others, as the mucilaginous leaves, from the ſame cauſe, loſing the property for which they are officinal. Aromatics are to be collected after the flower-buds are formed; annuals, not aromatic, when they are about to flower, or when in flower; biennials, before they ſhoot; and perennials, before they flower, eſpecially if their fibres become woody.

318. They are to be gathered in dry weather, after the dew is off them, or in the evening before it falls, and are to be freed from decayed, withered, or foreign leaves. They are uſually tied in bundles, and hung up in a ſhady, warm, and airy place; or ſpread upon the floor, and frequently turned. If very juicy, they are laid upon a ſieve, and dried by a gentle degree of artificial warmth.

319. Sprouts are collected before the buds open; and ſtalks are gathered in autumn.

320. Barks and woods are collected when the moſt active part of the vegetables are concentrated in them, which happens in ſpring and in autumn. Spring is preferred for reſinous barks, and autumn for the others which are not reſinous, but rather gummy.

Barks ſhould be taken from young trees, and freed from decayed parts, and all impurities.

321. The ſame rules direct the collection of woods; but they muſt not be taken from very young trees. Among the reſinous woods, the heavieſt, which ſink in water, are ſelected. The alburnum is to be rejected.

322. Flowers are collected in clear dry weather, before noon, but after the dew is off: either when they are juſt about to open, or immediately after they have opened. Of ſome the petals only are preſerved, and the colourleſs claws are even cut away; of others whoſe calyx is odorous, the whole flower is kept. Flowers which are too ſmall to be pulled ſingly, are dried with part of the ſtalk: Theſe are called heads or tops.

323. Flowers are to be dried nearly as leaves, but more quickly, and with more attention. As they muſt not be expoſed to the ſun, it is beſt done by a ſlight degree of artificial warmth. When they looſe their colour and ſmell they are unfit for uſe.

324. Seeds and fruits, unleſs when otherwiſe directed, are to be gathered when ripe, but before they fall ſpontaneouſly. Some pulpy fruits are freed from their core and ſeeds, ſtrung upon thread, and dried artificially. They are in general beſt preſerved in their natural coverings, although ſome, as the colocynth, are peeled, and others, as the tamarind, preſerved freſh. Many of theſe are apt to ſpoil, or become rancid; and as they are then no longer fit for medical uſe, no very large quantity of them ſhould be collected at a time.

325. The proper drying of vegetable ſubſtances is of the greateſt importance. It is often directed to be done in the ſhade, and ſlowly, that the volatile and active particles may not be diſſipated by too great heat; but this is an error, for they always loſe infinitely more by ſlow than by quick drying. When, on account of the colour, they cannot be expoſed to the ſun, and the warmth of the atmoſphere is inſufficient, they ſhould be dried by an artificial warmth, leſs than 100° Fahrenheit, and well expoſed to a current of air. When perfectly dry and friable, they have little ſmell; but after being kept ſome time, they attract moiſture from the air, and regain their proper odour.

326. The boxes and drawers in which vegetable matters are kept, ſhould not impart to them any ſmell or taſte; and more certainly to avoid this, they ſhould be lined with paper. Such as are volatile, of a delicate texture, or ſubject to ſuffer from inſects, muſt be kept in well covered glaſſes. Fruits and oily ſeeds, which are apt to become rancid, muſt be kept in a cool, and dry, but by no means in a warm, or moiſt, place.

327. Oily ſeeds, odorous plants, and thoſe containing volatile principles, muſt be collected freſh every year. Others, whoſe

properties are more permanent, and not ſubject to decay, will keep for ſeveral years.

328. Vegetables collected in a moiſt and rainy ſeaſon, are in general more watery and apt to ſpoil. In a dry ſeaſon, on the contrary, they contain more oily and reſinous particles, and keep much better.

MECHANICAL OPERATIONS of PHARMACY.

a. The determination of the weight and bulk of bodies.
b. The diviſion of bodies into more minute particles.
c. The ſeparation of their integrant parts by mechanical means.
d. Their mixture, when not attended by any chemical action.

329. The quantities of ſubſtances employed in pharmaceutical operations are moſt accurately determined by the proceſs called weighing. For this purpoſe, there ſhould be ſets of beams and ſcales of different ſizes; and it would be adviſable to have a double ſet, one for ordinary uſe, and another for occaſions when greater accuracy is neceſſary. A good beam ſhould remain in equilibrium without the ſcales, and when the ſcales are changed; and it ſhould turn ſenſibly with a very ſmall proportion of the weight with which it is loaded. Balances ſhould be defended as much as poſſible from acid and other corroſive vapours, and ſhould not be left ſuſpended longer than is neceſſary, as it impairs their delicacy very much. For the ſame reaſon, balances ſhould never be overloaded.

330. The want of uniformity of weights and meaſures is attended with many inconveniencies. In this country, druggiſts and grocers ſell by avoirdupois weight; and the apothecaries are directed to ſell by troy weight, although, in fact, they ſeldom uſe the troy weight for more than two drachms. Hence ariſe numerous and culpable errors, the troy pound being leſs than the avoirdupois, and the ounce and drachm being greater. Comparative tables of the value of the troy, avoirdupois, and new French decimal weights, are given in the appendix.

331. The errors ariſing from the promiſcuous uſe of weights and meaſures, have induced the Edinburgh and Dublin colleges to reject the uſe of meaſures entirely, and to direct that the quantities of every thing fluid, as well as ſolid, ſhall be determined by troy weight: But as the London college have given their ſanction to the uſe of meaſures, and as, from the much greater facility of their employment, apothecaries will always uſe them, tables of meaſures are alſo inſerted in the appendix.

332. For meaſuring fluids, the graduated glaſs meaſures are always to be preferred: they ſhould be of different ſizes, according to the quantities they are intended to meaſure. Elaſtic fluids are alſo meaſured in glaſs tubes, graduated by inches and their decimals.

333. Specific gravity is the weight of a determinate bulk of any body. As a ſtandard of compariſon, diſtilled water has been aſſumed as unity. The ſpecific gravity of ſolids is aſcertained, by comparing the weight of the body in the air with its weight when ſuſpended in water. The quotient obtained by dividing its weight in air, by the difference between its weight in air and its weight in water, is its ſpecific gravity. The ſpecific gravity of fluids may be aſcertained by comparing the loſs of weight of a ſolid body, ſuch as a piece of cryſtal, when immerſed in diſtilled water, with its loſs when immerſed in the fluid we wiſh to examine; by dividing its loſs of weight in the fluid by its loſs of weight in the water, the quotient is the ſpecific gravity of the fluid: Or a ſmall phial, containing a known weight of diſtilled water, may be filled with the fluid to be examined and weighed, and by dividing the weight of the fluid by the weight of the water, the ſpecific gravity is aſcertained.

Although theſe are the only general principles by which ſpecific gravities are aſcertained, yet as the reſult is always influenced by the ſtate of the thermometer and barometer at the time of the experiments, and as the manipulation is a work of great nicety, various ingenious inſtruments have been contrived to render the proceſs and calculation eaſy. Of all theſe, the gravimeter of Morveau ſeems to deſerve the preference.

It would be of material conſequence to ſcience and the arts, if ſpecific gravities were always indicated by the numerical term expreſſing their relation to the ſpecific gravity of diſtilled water. This however is unfortunately not the caſe. The exciſe in this country collect the duties paid by ſpiritous liquors, by eſtimating the proportion which they contain of a ſtandard ſpirit, about 0.933 in ſpecific gravity, which they call hydrometer proof, and they expreſs the relation which ſpirits of a different ſtrength have to the ſtandard ſpirit by ſaying that they are above or under hydrometer proof. Thus one to ſix, or one in ſeven below hydrometer proof means that it is equal in ſtrength to a mixture of ſix parts of proof ſpirit with one of water.

The only other mode of expreſſing ſpecific gravities, which it is neceſſary to notice is that of Baumé's areometer, as it is often uſed in the writings of the French chemiſts, and is little underſtood in this country. For ſubſtances heavier than water he aſſumes the ſpecific gravity of diſtilled water as zero, and graduates the ſtem of his inſtrument downwards, each degree being ſuppoſed by him to expreſs the number of parts of muriate of ſoda contained in a given ſolution, which however is not at all the caſe. For ſubſtances lighter than water the tube is graduated upwards, and this zero is afforded by a ſolution of 10 of ſalt in 90 water. In the appendix tables are given of the ſpecific gravities, correſponding with all the degrees of both of theſe areometers, from Nicholſon's journal.

MECHANICAL DIVISION.

334. By mechanical diviſion, ſubſtances are reduced to a form better adapted for medical purpoſes; and by the increaſe of their ſurface, their action is promoted, both as medical and chemical agents.

335. It is performed by cutting, bruiſing, grinding, grating, raſping, filing, pulverization, trituration, and granulation, by means of machinery or of proper inſtruments.

336. *Pulverization* is the firſt of theſe operations that is commonly employed in the apothecary's ſhop. It is performed by means of peſtles and mortars. The bottom of the mortars ſhould be concave; and their ſides ſhould neither be ſo inclined as not to allow the ſubſtances operated on to fall to the bottom between each ſtroke of the peſtle, nor ſo perpendicular as to collect it too much together, and to retard the operation. The materials of which the peſtles and mortars are formed, ſhould reſiſt both the mechanical and chemical action of the ſubſtances for which they are uſed. Wood, iron, marble, ſiliceous ſtones, porcelain, and glaſs, are all employed; but copper, and metals containing copper, are to be avoided.

337. They ſhould be provided with covers, to prevent the fineſt and lighteſt parts from eſcaping, and to defend the operator from the effects of diſagreeable or noxious ſubſtances. But theſe ends are more completely attained by tying a piece of pliable leather round the peſtle and round the mouth of the mortar. It muſt be cloſely applied, and at the ſame time ſo large, as to permit the free motion of the peſtle.

338. In ſome inſtances, it will be even neceſſary for the operator to cover his mouth and noſtrils with a wet cloth, and to ſtand with his back to a current of air, that the very acrid particles which ariſe may be carried from him.

339. The addition of a little water or ſpirit of wine, or of a few almonds, to very light and dry ſubſtances, will prevent their flying off. But almonds are apt to induce rancidity, and powders are always injured, by the drying which is neceſſary when they have been moiſtened. Water muſt never be added to ſubſtances which abſorb it, or are rendered coheſive by it.

340. Too great a quantity of any ſubſtance muſt never be put

into the mortar at a time, as it very much retards the operation.

341. All vegetable ſubſtances muſt be previouſly dried. Reſins and gummy reſins, which become ſoft in ſummer, muſt be powdered in very cold weather, and muſt be beaten gently, or they will be converted into a paſte inſtead of being powdered. Wood, roots, barks, horn, bone, ivory, &c. muſt be previouſly cut, ſplit, chipped or raſped. Fibrous woods and roots ſhould be finely ſhaved after their bark is removed, for otherwiſe, their powders will be full of hair-like filaments, which can ſcarcely be ſeparated. Some ſubſtances will even require to be moiſtened with mucilage of tragacanth, or of ſtarch, and then dried before they can be powdered. Camphor may be conveniently powdered by the addition of a little ſpirit of wine, or almond oil. The emulſive ſeeds cannot be reduced to powder, unleſs ſome dry powder be added to them. To aromatic oily ſubſtances, ſugar is the beſt addition.

342. All impurities and inert parts having been previouſly ſeparated, the operation muſt be continued and repeated upon vegetable ſubſtances, till no reſiduum is left. The powders obtained at different times muſt then be intimately mixed together, ſo as to bring the whole to a ſtate of perfect uniformity.

343. Very hard ſtony ſubſtances muſt be repeatedly heated to a red heat, and then ſuddenly quenched in cold water, until they become ſufficiently friable. Some metals may be powdered hot in a heated iron mortar, or may be rendered brittle by alloying them with a little mercury.

344. *Trituration* is intended for the ſtill more minute diviſion of bodies. It is performed in flat mortars of glaſs, agate, or other hard materials, by giving a rotatory motion to the peſtle; or on a levigating ſtone, which is generally of porphyry, by means of a muller of the ſame ſubſtance. On large quantities it is performed by rollars of hard ſtone, turning horizontally upon each other, or by one vertical roller turning on a flat ſtone.

345. The ſubſtances ſubjected to this operation are generally previouſly powdered or ground.

346. *Levigation* differs from trituration only in the addition of water or ſpirit of wine to the powder operated upon, ſo as to form the whole maſs into a kind of paſte, which is rubbed until it be of ſufficient ſmoothneſs or fineneſs. Earths, and ſome metallic ſubſtances, are levigated.

347. *Granulation* is employed for the mechanical diviſion of ſome metals. It is performed, either by ſtirring the melted metal with an iron-rod until it cools, or by pouring it into water, and ſtirring it continually as before, or by pouring it into a covered box, previouſly well rubbed with chalk, and ſhaking it until the metal

cools, when the rolling motion will be converted into a rattling one. The adhering chalk is then to be waſhed away.

MECHANICAL SEPARATION.

348. *Sifting.* From dry ſubſtances, which are reduced to the due degree of minuteneſs, the coarſer particles are to be ſeparated by ſieves of iron-ware, hair-cloth or gauze, or by being duſted through bags of fine linen. For very light and valuable powders, or acrid ſubſtances, compound ſieves, having a cloſe lid and receiver muſt be uſed. The particles which are not of ſufficient fineneſs to paſs through the interſtices of the ſieve, may be again powdered.

349. *Elutriation* is confined to mineral ſubſtances, on which water has no action. It is performed for ſeparating them from foreign particles and impurities, of a different ſpecific gravity, in which caſe they are ſaid to be waſhed; or for ſeparating the impalpable powders, obtained by trituration and levigation from the coarſer particles. This proceſs depends upon the property that very fine or light powders have of remaining for ſome time ſuſpended in water; and is performed by diffuſing the powder or paſte formed by levigation through plenty of water, letting it ſtand a ſufficient time, until the coarſer particles ſettle at the bottom; and then pouring off the liquid in which the finer or lighter particles are ſuſpended. Freſh water may be poured on the reſiduum, and the operation repeated; or the coarſer particles, which fall to the bottom, may be previouſly levigated a ſecond time.

350. *Decantation.* The fine powder which is waſhed over with the water, is ſeparated from it, by allowing it to ſubſide completely, and by either decanting off the water very carefully, or by drawing it off by a ſyringe or ſyphon. Theſe proceſſes are very frequently made uſe of for ſeparating fluids from ſolids which are ſpecifically heavier, eſpecially when the quantity is very large, or the ſolid ſo ſubtile as to paſs through the pores of moſt ſubſtances employed for filtration, or the liquid ſo acrid as to corrode them.

351. *Filtration.* For the ſame purpoſe of ſeparating fluids from ſolids, ſtraining and filtration are often uſed. Theſe differ only in degree, and are employed when the powder either does not ſubſide at all, or too ſlowly and imperfectly for decantation.

352. The inſtruments for this purpoſe are of various materials, and muſt in no inſtance be acted upon by the ſubſtances for which they are employed. Fats, reſins, wax and oils, are ſtrained through hemp or flax ſpread evenly over a piece of wire-cloth or net ſtretched in a frame. For ſaccharine and mucilaginous liquors, fine

flannel may be uſed; for ſome ſaline ſolutions, linen. Where theſe are not fine enough, unſized paper is employed, but it is extremely apt to burſt by hot watery liquors which diſſolve its ſize; and very acrid liquors, ſuch as acids, are filtered by means of a glaſs-funnel, filled with powdered quartz, a few of the larger pieces being put in the neck, ſmaller pieces over theſe, and the finer powder placed over all. The poroſity of this laſt filter retains much of the liquor; but it may be obtained by gently pouring on it as much diſtilled water; the liquor will then paſs through, and the water be retained in its place.

353. Water may be filtered in large quantities through baſins of porous ſtone, or artificial baſins of nearly equal parts of fine clay and coarſe ſand.

354. The ſize of the filters depends on the quantity of matter to be ſtrained. When large, the flannel or linen is formed into a conical bag, and ſuſpended from a hoop or frame; the paper is either ſpread on the inſide of theſe bags, or folded into a conical form, and ſuſpended by a funnel. It is of advantage to introduce glaſs rods or quill-barrels between the paper and funnel, to prevent them from adhering too cloſely.

355. What paſſes firſt is ſeldom fine enough, and muſt be poured back again, until by the ſwelling of the fibres of the filter, or filling up of its pores, the fluid acquires the requiſite degree of limpidity. The filter is ſometimes covered with charcoal powder, which is a uſeful addition to muddy and deep-coloured liquors. The filtration of ſome viſcid ſubſtances is much aſſiſted by heat.

356. *Expreſſion* is a ſpecies of filtration, aſſiſted by mechanical force. It is principally employed to obtain the juices of freſh vegetables, and the unctuous vegetable oils. It is performed by means of a ſcrew preſs with plates of wood, iron or tin. The ſubject of the operation is previouſly beaten, ground or bruiſed. It is then incloſed in a bag, which muſt not be too much filled, and introduced between the plates of the preſs. The bags ſhould be of hair-cloth, or canvaſs incloſed in hair-cloth. Hempen and woollen bags are apt to give vegetable juices a diſagreeable taſte. The preſſure ſhould be gentle at firſt, and increaſed gradually.

357. Vegetables intended for this operation ſhould be perfectly freſh and freed from all impurities. In general they ſhould be expreſſed as ſoon as they are bruiſed, for it diſpoſes them to ferment; but ſubacid fruits give a larger quantity of juice and of finer quality, when they are allowed to ſtand ſome days in a wooden or earthen veſſel after they are bruiſed. To ſome vegetables which are not juicy enough of themſelves, the addition of a little water is neceſſary. Lemons and oranges muſt be peeled, as their ſkins contain a great deal of eſſential oil, which would mix with the juice.

The oil itſelf may be obtained ſeparately, by expreſſion with the fingers againſt a plate of glaſs.

358. For unctuous ſeeds iron-plates are uſed; and it is cuſtomary not only to heat the plates, but to warm the bruiſed ſeeds in a kettle over the fire, after they have been ſprinkled with ſome water, as by theſe means the product is increaſed, and the oil obtained is more limpid. But as their diſpoſition to rancidity is increaſd by it, if poſſible this practice ſhould be laid aſide, or confined to expoſing the bruiſed ſeeds, incloſed in a bag, to the ſteam of hot water.

359. *Deſpumaticn* is generally practiſed on thick and clammy liquors, which contain much ſlimy and other impurities, not eaſily ſeparable by filtration. The ſcum ariſes either by ſimply heating the liquor, or by *clarifying* it, which is done by mixing with the liquor, when cold, whites of eggs well beaten with a little water, which on being heated coagulates, and entangling the impurities of the liquor, riſes with them to the ſurface, and may be eaſily removed by a perforated ladle. Or the liquor may now be filtered with eaſe. Spiritous liquors are clarified by means of iſinglaſs diſſolved in water, or any albuminous fluid, ſuch as milk, which coagulates by the action of alcohol without the aſſiſtance of heat. Some expreſſed juices, ſuch as thoſe of the antiſcorbutic plants, are inſtantly clarified by the addition of vegetable acid, ſuch as the juice of bitter oranges.

360. Fluids can only be ſeparated from each other, when they have no tendency to combine, and when they differ in ſpecific gravity. The ſeparation may be effected by ſkimming off the lighter fluid with a ſilver or glaſs ſpoon; or by drawing it off by a ſyringe or ſyphon; or by means of a glaſs ſeparatory, which is an inſtrument having a projecting tube, terminating in a very ſlender point, through which the heavier fluid alone is permitted to run; or by means of the capillary attraction of a ſpongy woollen thread; for no fluid will enter a ſubſtance whoſe pores are filled by another, for which it has no attraction; and, laſtly, upon the ſame principle, by means of a filter of unſized paper, previouſly ſoaked in one of the fluids, which in this way readily paſſes through it, while the other remains behind.

361. *Mechanical mixture* is performed by agitation, trituration, or kneading; but theſe will be beſt conſidered in treating of the forms in which medicines are exhibited.

APPARATUS.

362. Before entering on the chemical operations, it will be neceſſary to make a few remarks on the inſtruments employed in performing them. They may be divided into

a. The veſſels in which the effects are peformed.
b. The means of producing heat; or fuel; and
c. The means of applying and regulating the heat; or lamps and furnaces.

VESSELS.

363. The veſſels, according to the purpoſes for which they are intended, vary

a. In form, and
b. In materials.

364. The different forms will be beſt deſcribed when treating of the particular operations.

365. No ſubſtance poſſeſſes properties which would render it proper to be employed as a material in every inſtance. We are therefore obliged to ſelect thoſe ſubſtances which poſſeſs the properties more eſpecially required in the particular operations for which they are intended.

366. The properties moſt generally required, are

a. The power of reſiſting chemical agents.
b. Tranſparency.
c. Compactneſs.
d. Strength.
e. Fixity and infuſibility.
f. And the power of bearing ſudden variations of temperature without breaking.

367. The metals in general poſſeſs the four laſt properties in conſiderable perfection, but they are all opaque. Iron and copper are apt to be corroded by chemical agents, and the uſe of the latter is often attended by dangerous conſequences. Theſe defects are in ſome meaſure, but not entirely, remedied by tinning them. Tin and lead are too fuſible. Platinum, gold, and ſilver, reſiſt moſt of the chemical agents, but their expence is an inſurmountable objection to their general uſe.

368. Good earthen-ware reſiſts the greateſt intenſity of heat, but is deficient in all the other properties. The baſis of all kinds of earthen-ware is clay, which poſſeſſes the valuable quality of being very plaſtic when wrought with water, and of becoming extremely hard when burnt with an intenſe heat. But it contracts ſo much by heat, that it is extremely apt to crack and ſplit on being expoſed to ſudden changes of temperature; it is therefore neceſſary to add ſome ſubſtance which may counteract this property.

Siliceous ſand, clay reduced to power, and then burnt with a very intenſe heat, and plumbago, are occaſionally uſed. Theſe additions, however, are attended with other inconveniencies; plumbago eſpecially is liable to combuſtion, and ſand diminiſhes the compactneſs; ſo that when not glazed, they are porous, and when glazed, they are acted upon by chemical agents. The chemical veſſels, manufactured by Meſſrs Wedgewood, are the beſt of this deſcription, except porcelain, which is too expenſive.

369. Glaſs poſſeſſes the three firſt qualities in an eminent degree, and may be heated red-hot without melting. Its greateſt inconvenience is its diſpoſition to crack or break in pieces when ſuddenly heated or cooled. As this is occaſioned by its unequal expanſion or contraction, it is beſt remedied by forming the veſſels very thin, and giving them in general a rounded form. Glaſs-veſſels ſhould alſo be well annealed, that is, cooled very ſlowly, after being blown, by placing them immediately in an oven while they are yet in a ſoft ſtate. While ill annealed, or cooled ſuddenly, glaſs is apt to fly in pieces on the ſlighteſt change of temperature, or touch of a ſharp point. We may ſometimes take advantage of this imperfection; for by means of a red-hot wire, glaſs-veſſels may be cut into any ſhape. When there is not a crack already in the glaſs, the point of the wire is applied near the edge, a crack is formed, which is afterwards eaſily led in any direction we wiſh.

370. Reaumur's porcelain, on the contrary, is glaſs, which by ſurrounding it with hot ſand, is made to cool ſo ſlowly, that it aſſumes a cryſtalline texture, which deſtroys its tranſparency, but imparts to it every other quality wiſhed for in chemical veſſels. The coarſer kinds of glaſs are commonly uſed in making it; but as there is no manufacture of this valuable ſubſtance, its employment is ſtill very limited.

LUTES.

371. Lutes alſo form a neceſſary part of chemical apparatus. They are compoſitions of various ſubſtances, intended

a. To cloſe the joining of veſſels.
b. To coat glaſs veſſels.
c. To line furnaces.

372. Lutes of the firſt deſcription are commonly employed to confine elaſtic vapours. They ſhould therefore poſſeſs the following properties,

a. Viſcidity, plaſticity, and compactneſs.
b. The power of reſiſting acrid vapours.

c. The power of reſiſting certain degrees of heat.

373. The viſcidity of lutes depends on the preſence either of

a. Unctuous or reſinous ſubſtances.
b. Mucilaginous ſubſtances, or
c. Clay.

374. Lutes of the firſt kind (373 *a.*) poſſeſs the two firſt claſs of properties in an eminent degree; but they are in general ſo fuſible that they cannot be employed when they are expoſed even to very low degrees of heat, and they will not adhere to any ſubſtance that is at all moiſt. Examples.

a. Eight parts of yellow wax melted with one of oil of turpentine, with or without the addition of reſinous ſubſtances, according to the degree of pliability and conſiſtence required. Lavoiſier's lute.
b. Four parts of wax melted with two of varniſh and one of olive oil. Sauſſure's lute.
c. Three parts of powdered clay worked up into a paſte, with one of drying oil, or, what is better, amber varniſh. The drying oil is prepared by boiling 22.5 parts of litharge in 16 of linſeed oil until it be diſſolved. Fat lute.
d. Chalk and oil, or glaziers-putty, is well fitted for luting tubes permanently into glaſs veſſels, for it becomes ſo hard that it cannot be eaſily removed.
e. Equal parts of litharge, quicklime, and powdered clay, worked into a paſte with oil varniſh, is ſometimes uſed to daub over the cracks in glaſs veſſels, ſo as to render them again fit for ſome purpoſes.
f. Melted pitch and brick duſt.

375. Mucilaginous ſubſtances, (373 *b.*) ſuch as flour, ſtarch, gum, and glue mixed with water, with or without ſome powder, are ſufficiently adheſive, are dried by moderate degrees of heat, and are eaſily removed after the operation, by moiſtening them with water. But a high temperature deſtroys them, and they do not reſiſt corroſive vapours. Examples.

a. Slips of bladder macerated in water, and applied with the inſide next the veſſels. They are apt, however, from their great contraction on drying, to break weak veſſels.
b. One part of gum arabic with ſix or eight of chalk, formed into a paſte with water.
c. Flour worked into a paſte with powdered clay or chalk.
d. Almond or linſeed meal formed into a paſte with mucilage or water.

e. Quicklime in fine powder, haſtily mixed with white of egg, and inſtantly applied, ſets very quickly, but becomes ſo hard that it can ſcarcely be removed.

f. Slaked lime in fine powder, with glue, does not ſet ſo quickly as the former.

g. The cracks of glaſs veſſels are ſometimes mended by daubing them and a ſuitable piece of linen over with white of egg, ſtrewing both over with finely powdered quicklime, and inſtantly applying the linen cloſely and evenly.

376. Earthy lutes (373 *c.*) reſiſt very high temperatures, but they become ſo hard that they can ſcarcely be removed, and often harden ſo quickly after they are mixed up, that they muſt be applied immediately. Examples.

a. Quicklime well incorporated with a ſixth part of muriate of ſoda.

b. Burnt gypſum, made up with water.

c. One ounce of borax diſſolved in a pound of boiling water, mixed with a ſufficient quantity of powdered clay. Mr. Watt's fire lute.

d. One part of clay with four of ſand formed into a paſte with water. This is alſo uſed for coating glaſs veſſels, in order to render them ſtronger and capable of reſiſting violent degrees of heat. It is then made into a very thin maſs, and applied in ſucceſſive layers, taking care that each coat be perfectly dry before another be laid on.

377. The lutes for lining furnaces will be deſcribed when treating of furnaces.

378. The junctures of veſſels which are to be luted to each other, muſt previouſly be accurately and firmly fitted, by introducing between them, when neceſſary, ſhort bits of wood or cork, or, if the diſproportion be very great, by means of a cork fitted to the one veſſel, having a circular hole bored through it, through which the neck of the other veſſel or tube paſſes.

379. After being thus fitted, the lute is either applied very thin, by ſpreading it on ſlips of linen or paper, and ſecuring it with thread, or if it is a paſte lute, it is formed into ſmall cylinders, which are ſucceſſively applied to the junctures, taking care that each piece be made to adhere firmly and perfectly cloſe in every part before another is put on. Laſtly, the whole is ſecured by ſlips of linen or bladder.

380. In many caſes, to permit tne eſcape of elaſtic vapours, a ſmall hole is made through the lute with a pin, or the lute is perforated by a ſmall quill, fitted with a ſtopper.

HEAT AND FUEL.

381. As caloric is an agent of the moſt extenſive utility in the chemical operations of pharmacy, it is neceſſary that we ſhould be acquainted with the means of employing it in the moſt economical and efficient manner.

382. The rays of the ſun are uſed in the drying of many vegetable ſubſtances, and the only attentions neceſſary are to expoſe as large a ſurface as poſſible, and to turn them frequently, that every part may be dried alike. They are alſo ſometimes uſed for promoting ſpontaneous evaporation.

383. The combuſtion of different ſubſtances is a much more powerful and certain ſource of heat. The ſubſtances employed for this purpoſe are either fluid or ſolid. Alcohol, oil, tallow, wood, turf, coal, charcoal, and coke, are all occaſionally employed.

384. Alcohol, oil, and melted tallow, fluid inflammables, muſt be burnt on porous wicks. Theſe act merely mechanically, by drawing up a portion of the fluid to be volatilized and inflamed. They are therefore burnt in lamps of various conſtructions. But although commonly uſed to produce light, they afford a very uniform, though not very high, temperature. It may however be increaſed by increaſing the number of the wicks and their ſize. Alcohol produces a ſteady heat, no ſoot, and, if ſtrong, leaves no reſiduum. Oil gives a higher temperature, but on a common wick produces much ſmoke and ſoot. Theſe are diminiſhed, and the light and heat increaſed, by making the ſurface of the flame bear a large proportion to the centre, which is beſt done by a cylindrical wick, ſo contrived that the air has free acceſs both to the outſide and to the inſide of the cylinder, as in Argand's lamp, invented by Mr. Boulton of Birmingham. In this way oil may be made to produce a conſiderable temperature of great uniformity, and without the inconvenience of ſmoke.

385. Wicks have the inconvenience of being charred by the high temperature to which they are ſubjected, and becoming ſo clogged as to prevent the fluid from riſing in them. They muſt then be trimmed, but this is ſeldomer neceſſary with alcohol and fine oils than with the coarſer oils. Lamps are alſo improved by adding a chimney to them. It muſt admit the free acceſs of air to the flame, and then it increaſes the current, confines the heat, and ſteadies the flame. The intenſity of the temperature of flame may be increaſed aſtoniſhingly by forcing a ſmall current of hot air through it as by the blow pipe.

386. Wood, turf, coal, charcoal, and coke, ſolid combuſtibles, are burnt in grates and furnaces. Wood has the advantage of kindling readily, but affords a very unſteady temperature, is inconvenient from its flame, ſmoke, and ſoot, and requires much atten-

tion. The heavy and denſe woods give the greateſt heat, burn longeſt, and leave a denſe charcoal.

387. Dry turf gives a ſteady heat, and does not require ſo much attention as wood; but it conſumes faſt, its ſmoke is copious and penetrating, and the empyreumatic ſmell which it imparts to every thing it comes in contact with, adheres to them with great obſtinacy. The heavy turf of marſhes is preferable to the light ſuperficial turf.

388. Coal is the fuel moſt commonly uſed in this country. Its heat is conſiderable and ſufficiently permanent, but it produces much flame and ſmoke.

389. Charcoal, eſpecially of the denſe woods, is a very convenient and excellent fuel. It burns without flame or ſmoke, and gives a ſtrong, uniform, and permanent heat, which may be eaſily regulated, eſpecially when it is not in too large pieces, and is a little damp. But it is coſtly, and burns quickly.

390. Coke, or charred coal, poſſeſſes ſimilar properties to charcoal, it is leſs eaſily kindled, but is capable of producing a higher temperature, and burns more ſlowly.

391. When an open grate is uſed for chemical purpoſes, it ſhould be provided with cranes to ſupport the veſſels operated in, that they may not be overturned by the burning away of the fuel.

Furnaces.

392. In all furnaces, the principal objects are, to produce a ſufficient degree of heat, with little conſumption of fuel, and to be able to regulate the degree of heat.

393. An unneceſſary expenditure of fuel is prevented by forming the ſides of the furnace of very imperfect conductors of caloric, and by conſtructing it ſo that the ſubject operated on may be expoſed to the full action of the fire.

394. The degree of heat is regulated by the quantity of air which comes in contact with the burning fuel. The quantity of air is in the compound ratio of the ſize of the aperture through which it enters and its velocity. The velocity is increaſed by mechanical means, as by bellows, or by increaſing the height and width of the chimney.

395. The ſize and form of furnaces, and the materials of which they are conſtructed, are various, according to the purpoſes for which they are intended.

396. The eſſential parts of a furnace are,

a. A body for the fuel to burn in.
b. A grate for it to burn upon.
c. An aſh-pit to admit air and receive the aſhes.
d. A chimney for carrying off the ſmoke and vapours.

397. The aſh-pit ſhould be perfectly cloſe, and furniſhed with a door and regiſter-plate, to regulate the quantity of air admitted.

398. The bars of the grate ſhould be triangular, and placed with an angle pointed downwards, and not above half an inch diſtant. The grate ſhould be fixed on the outſide of the body.

399. The body may be cylindrical or eliptical, and it muſt have apertures for introducing the fuel and the ſubjects of the operation, and for conveying away the ſmoke and vapours.

400. When the combuſtion is ſupported by the current of air naturally excited by the burning of the fuel, it is called a wind-furnace; when it is accelerated by increaſing the velocity of the current by bellows, it forms a blaſt-furnace; and when the body of the furnace is covered with a dome, which terminates in the chimney, it conſtitutes a reverberatory furnace.

401. Furnaces are either fixed, and built of fire-brick, or portable, and fabricated of plate-iron. When of iron, they muſt be lined with ſome badly conducting and refractory ſubſtance, both to prevent the diſſipation of heat, and to defend the iron againſt the action of the fire. A mixture of ſcales of iron and powdered tiles worked up with blood, hair, and clay, is much recommended; and Profeſſor Hagen ſays, that it is leſs apt to ſplit and crack when expoſed at once to a violent heat, than when dried gradually, according to the common directions. Dr. Black employed two different coatings. Next to the iron he applied a compoſition of three parts by weight of charcoal, and one of fine clay. Theſe are firſt mixed in the ſtate of fine powder, and then worked up with as much water as will permit the maſs to be formed into balls, which are applied to the ſides of the furnace, and beat very firm and compact with the face of a broad hammer, to the thickneſs of about one inch and a half in general, but ſo as to give an elliptical form to the cavity. Over this, another lute, compoſed of ſix or ſeven parts of ſand, and one of clay, is to be applied in the ſame manner, to the thickneſs of about half an inch. Theſe lutes muſt be allowed to become perfectly dry before the furnace is heated, which ſhould at firſt be done gradually. They may alſo be lined with fire bricks of a proper form, accurately fitted and well cemented together before the top plate is ſcrewed on.

402. The general fault of furnaces is that they admit too much air, which prevents us from regulating the temperature. It either becomes too violent and unmanageable, or when more cold air is admitted than what is neceſſary for ſupporting the combuſtion, it carries off heat, and prevents us from raiſing the temperature as high as we otherwiſe would. The ſuperior merit of Dr. Black's furnace conſiſts in the facility with which the admiſſion of air is regulated; and every attempt hitherto made to improve it by increaſing the number of its apertures have in reality injured it.

403. Heat may be applied to veſſels employed in chemical operations,

a. Directly, as in the open fire and reverberatory furnace.
b. Or through the medium of ſand; the ſand-bath.
c. Of water; the water-bath.
d. Of ſteam; the vapour-bath.
e. Of air, as in the muffle.

CHEMIAL OPERATIONS.

404. In all chemical operations, combination takes place, and there are very few of them in which decompoſition does not alſo occur. For the ſake of method, we ſhall conſider them as principally intended to produce

a. A change in the form of aggregation.
b. Combination.
c. Decompoſition.

405. The form of aggregation may be altered by

a. Fuſion.
b. Vaporization.
c. Condenſation.
d. Congelation.
e. Coagulation.

406. *Fuſion* is the converſion of a ſolid into a liquid by the ſole agency of caloric. Subſtances differ very much in the degrees of their fuſibility; ſome, as water and mercury, exiſting as fluids in the ordinary temperatures of the atmoſphere; while others, as the pure earths, cannot be melted by any heat we can produce.

407. *Liquefaction* is commonly employed to expreſs the melting of ſubſtances, as tallow, wax, reſin, &c. which paſs through intermediate ſtates of ſoftneſs before they become fluid. Fuſion is the melting of ſubſtances which paſs immediately from the ſolid to the fluid ſtate, as the ſalts and metals, except iron and platinum.

408. When, in conſequence of fuſion, the ſubſtances operated on acquire a greater or leſs degree of tranſparency, a denſe uniform texture, and great brittleneſs, and exhibit a conchoidal fracture, with a ſpecular ſurface, and the edges of the fragments very ſharp, it is termed *vitrification*.

409. In general, ſimple ſubſtances are leſs fuſible than compounds; for example, the ſimple earths cannot be melted ſingly, but when mixed, are eaſily fuſed. The additions which are ſome

times made to refractory ſubſtances to promote their fuſion, are termed *fluxes*.

410. Theſe fluxes are generally ſaline bodies.

a. The alkalies potaſs and ſoda, promote powerfully the fuſion of ſiliceous ſtones; but they are only uſed for accurate experiments. The *white flux* is a mixture of a little potaſs with carbonate of potaſs, and is prepared by deflagrating together equal parts of nitrate of potaſs and ſuper-tartrate of potaſs. When an oxide is at the ſame time to be reduced, the *black* flux is preferred, which is produced by the deflagration of two parts of ſuper-tartrate of potaſs, und one of nitrate of potaſs. It differs from the former only in containing a little charcoal. Soap promotes fuſion by being converted by the fire into carbonate of ſoda and charcoal.

b. Aluminous ſtones have their fuſion greatly promoted by the addition of ſub-borate of ſoda.

c. Muriate of ſoda, the mixed phoſphate of ſoda and ammonia, and other ſalts, are alſo occaſionally employed.

411. An open fire is ſufficient to melt ſome ſubſtances, others require the heat of a furnace.

412. The veſſels in which fuſion is performed, muſt reſiſt the heat neceſſary for the operation. In ſome inſtances, an iron or copper ladle or pot may be uſed, but moſt commonly crucibles are employed. Crucibles are of various ſizes. The large crucibles are generally conical, with a ſmall ſpout for the convenience of pouring out; the ſmall ones are truncated triangular pyramids, and are commonly ſold in neſts.

413. The Heſſian crucibles are compoſed of clay and ſand, and when good, will ſupport an intenſe heat for many hours, without ſoftening or melting; but they are diſpoſed to crack when ſuddenly heated or cooled. This inconvenience may be on many occaſions avoided, by uſing a double crucible, and filling up the interſtice with ſand, or by covering the crucible with a lute of clay and ſand, by which means the heat is tranſmitted more gradually and equally. Thoſe which ring clearly when ſtruck, and are of an uniform thickneſs, and have a reddiſh brown colour, without black ſpots, are reckoned the beſt.

414. Wedgewood's crucibles are made of clay mixed with baked clay finely pounded, and are in every reſpect ſuperior to the Heſſian, but they are very expenſive.

415. The black-lead crucibles, formed of clay and plumbago, are very durable, reſiſt ſudden changes of temperature, and may be repeatedly uſed, but they are deſtroyed when ſaline ſubſtances

are melted in them, and ſuffer combuſtion when expoſed red-hot to a current of air.

416. When placed in a furnace, crucibles ſhould never be ſet upon the bars of the grate, but always upon a ſupport. Dr. Kennedy found the hotteſt part of a furnace to be about an inch above the grate. They may be covered, to prevent the fuel or aſhes from falling into them, with a lid of the ſame materials, or with another crucible inverted over them.

417. When the fuſion is completed, the ſubſtance may be either permitted to cool in the crucible, or may be poured into a heated mould anointed with tallow, never with oil, or what is ſtill better, covered with a thin coating of chalk, which is applied by laying it over with a mixture of chalk diffuſed in water, and then evaporating the water completely by heat. To prevent the crucible from being broken by cooling too rapidly, it is to be either replaced in the furnace, to cool gradually with it, or covered with ſome veſſel to prevent its being expoſed immediately to the air.

418. Fuſion is performed with the intentions,

a. Of weakening the attraction of aggregation.
  1. To facilitate mechanical diviſion.
  2. To promote chemical action.

b. Of ſeparating from each other, ſubſtances of different degrees of fuſibility.

419. *Vaporization* is the converſion of a ſolid or fluid into vapour by the agency of caloric. Although vaporability be merely a relative term, ſubſtances are ſaid to be permanently elaſtic, volatile, or fixed. The permanently elaſtic fluids or gaſes are thoſe which cannot be condenſed inro a fluid or ſolid form by any abſtraction of caloric we are capable of producing. Fixed ſubſtances, on the contrary, are thoſe which cannot be converted into vapour by great increaſe of temperature. The preſſure of the atmoſphere has very conſiderable effect in varying the degree at which ſubſtances are converted into vapour. Some ſolids, unleſs ſubjected to very great preſſure, are at once converted into vapour, although moſt of them paſs through the intermediate ſtate of fluidity.

420. Vaporization is employed

a. To ſeparate ſubſtances differing in volatility.
b. To promote chemical action, by diſaggregating them.

421. When employed with either of theſe views,

a. No regard is paid to the ſubſtances volatilized,
  1. From ſolids, as in uſtulation and charring.
  2. From fluids, as in evaporation.

b. Or the ſubſtances vaporized are condenſed in proper veſſels,
1. In a liquid form, as in diſtillation.
2. In a ſolid form, as in ſublimation.

c. Or the ſubſtances vaporized are permanently elaſtic, and are collected in their gaſeous form, in a pneumatic apparatus.

422. *Uſtulation* is almoſt entirely a metallurgic operation, and is employed to expel the ſulphur and arſenic contained in ſome metallic ores. It is performed on ſmall quantities in teſts placed within a muffle. Teſts are ſhallow veſſels made of bone aſhes or baked clay. Muffles are veſſels of baked clay, of a ſemi-cylindrical form, the flat ſide forming the floor, and the arched portion the roof and ſides. The end and ſides are perforated with holes for the free tranſmiſſion of air, and the open extremity is placed at the door of the furnace, for the inſpection and manipulation of the proceſs. The reverberatory furnace is commonly employed for roaſting, and the heat is at firſt very gentle, and ſlowly raiſed to redneſs. It is accelerated by expoſing as large a ſurface of the ſubſtance to be roaſted as poſſible, and by ſtirring it frequently, ſo as to prevent any agglutination, and to bring every part in ſucceſſion to the ſurface.

423. *Charring* may be performed on any of the compound oxides, by ſubjecting them to a degree of heat ſufficient to expel all their hydrogen, nitrogen, and ſuperabundant oxygen, while the carbon, being a fixed principle, remains behind in the ſtate of charcoal. The temperature neceſſary for the operation may be produced either by the combuſtion of other ſubſtances, or by the partial combuſtion of the ſubſtance to be charred. In the former caſe, the operation may be performed in any veſſel which excludes the acceſs of air, while it permits the eſcape of the vapours formed. In the latter, the acceſs of air muſt be regulated in ſuch a manner, that it may be ſuppreſſed whenever the combuſtion has reached the requiſite degree; for if continued to be admitted, the charcoal itſelf would be diſſipated in the form of carbonic acid gas, and nothing would remain but the alkaline and earthy matter, which theſe ſubſtances always contain. When combuſtion is carried this length, the proceſs is termed *incineration*. The vapours which ariſe in the operation of charring, are ſometimes condenſed, as in the manufacture of tar.

424. *Evaporation* is the converſion of a fluid into vapour, by its combination with caloric. In this proceſs, the atmoſphere is not a neceſſary agent, but rather a hinderance, by its preſſure. This forms a criterion between evaporation and ſpontaneous evaporation, which is merely the ſolution of a fluid in air.

425. It is performed in open, ſhallow, or hemiſpherical veſſels of ſilver, tinned copper or iron, earthen-ware or glaſs. The ne-

ceſſary caloric may be furniſhed by means of an open fire, a lamp, or a furnace, either immediately, or with the intervention of ſand, water, or vapour. The degree of heat muſt be regulated by the nature of the ſubſtance operated on. In general, it ſhould not be greater than what is abſolutely neceſſary.

426. Evaporation may be,

a. Partial.
  1. From ſaline fluids, concentration.
  2. From viſcid fluids, inſpiſſation.
b. Total, exſiccation.

427 *Concentration* is employed,

a. To leſſen the quantity of diluting fluids, dephlegmation.
b. As a preliminary ſtep to cryſtallization.

428. *Inſpiſſation* is almoſt confined to animal and vegetable ſubſtances; and as theſe are apt to be partially decompoſed by heat, or to become empyreumatic, it ſhould always be performed, eſpecially towards the end of the proceſs, in a water or vapour bath.

429. *Exſiccation* is here taken in a very limited ſenſe; for the term is alſo with propriety uſed to expreſs the drying of vegetables by a gentle heat, the eſſloreſcence of ſalts, and the abſtraction of moiſture from mixtures of inſoluble powders with water, by means of chalk-ſtones or powdered chalk preſſed into a ſmooth maſs. At preſent, we limit its meaning to the total expulſion of moiſture from any body by means of caloric.

430. The exſiccation of compound oxides ſhould always be performed in the water bath.

431. Salts are deprived of their water of cryſtallization by expoſing them to the action of heat in a glaſs veſſel or iron ladle. Sometimes they firſt diſſolve in their water of cryſtallization, or undergo what is called the *watery fuſion*, and are afterwards converted into a dry maſs by its total expulſion; as in the calcination of borax or burning of alum.

432. When exſiccation is attended with a crackling noiſe, and ſplitting of the ſalt, as in muriate of ſoda, it is termed *decrepitation*, and is performed by throwing into a heated iron veſſel, ſmall quantities of the ſalt at a time, covering it up, and waiting until the decrepitation be over, before a freſh quantity is thrown in.

433. Exſiccation is performed on ſaline bodies, to render them more acrid or pulverulent, or to prepare them for chemical operations. Animal and vegetable ſubſtances are exſiccated to give them a ſolid form, and to prevent their fermentation.

434. *Condenſation* is the reverſe of expanſion, and is produced either,

a. By mechanical preſſure forcing out the caloric in a ſenſible form, as water is ſqueezed out of a ſponge, or,
b. By the chemical abſtraction of caloric, which is followed by an approximation of the particles of the ſubſtance.

435. The latter ſpecies of condenſation only is the object of our inveſtigation at preſent, In this way we may be ſuppoſed to condenſe,

a. Subſtances exiſting naturally as gaſes or vapours.
b. Subſtances, naturally ſolid or fluid, converted into vapours by adventitious circumſtances.

436. The former inſtance is almoſt ſuppoſititious: for we are not able, by any diminution of temperature, to reduce the permanently elaſtic fluids, to a fluid or ſolid ſtate.

437. The latter inſtance is always preceded by vaporization, and comprehends thoſe operations in which the ſubſtances vaporized are condenſed in proper veſſels. When the product is a fluid, it is termed diſtillation; when ſolid, ſublimation.

438. *Diſtillation* is ſaid to be performed,

a. *Viâ humidâ*, when fluids are the ſubjects of the operation.
b. *Viâ ſiccâ*, when ſolids are ſubjected to the operation, and the fluid product ariſes from decompoſition, and a new arrangement of the conſtituent principles.

439. The objects of diſtillation are,

a. To ſeparate more volatile fluids from leſs volatile fluids or ſolids.
b. To promote the union of different ſubſtances.
c. To generate new products by the action of fire.

440. In all diſtillations, the heat applied ſhould not be greater than what is neceſſary for the formation of the vapour, and even to this degree it ſhould be gradually raiſed. The veſſels alſo in which the diſtillation is performed, ſhould never be filled above one-half, and ſometimes not above one-fourth, leſt the ſubſtance contained in them ſhould boil over.

441. As diſtillation is a combination of evaporation and condenſation, the apparatus conſiſts of two principal parts:

a. The veſſels in which the vapours are formed.
b. The veſſels in which they are condenſed.

442. The veſſels employed for both purpoſes are very various in their ſhapes, according to the manner in which the operation is

conducted. The firſt difference depends on the direction of the vapour after its formation. It either,

a. Deſcends; diſtillation *per deſcenſum.*
b. Aſcends: diſtillation *per aſcenſum.*
c. Or paſſes off by the ſide; diſtillation *per latus.*

443. In the diſtillation *per deſcenſum*, a perforated plate of tinned iron, or other materials, is fixed within any convenient veſſel, ſo as to leave a ſpace beneath it. On this the ſubject of the operation is laid, and over it is placed another plate, accurately cloſing the mouth of the veſſel, and ſufficiently ſtrong to ſupport the fuel. Thus the heat is applied from above, and the vapour is forced to deſcend into the inferior cavity, where it is condenſed. In this way the oil of cloves is prepared, and on the ſame principles tar is manufactured, and mercury and zinc are ſeparated from their ores.

444. In the diſtillation *per aſcenſum*, the vapour is allowed to ariſe to ſome height, and then is conveyed away to be condenſed. The veſſel moſt commonly employed for this purpoſe is the common copper ſtill, which conſiſts of a body for containing the materials, and a head into which the vapour aſcends. From the middle of the head a tube riſes for a ſhort way, and is then reflected downwards, through which the ſteam paſſes to be condenſed. Another kind of head, riſing to a great height before it is reflected, is ſometimes uſed for ſeparating fluids, which differ little in volatility, as it was ſuppoſed that the leſs volatile vapours would be condenſed and fall back into the ſtill, while only the more volatile vapours would ariſe to the top, ſo as to paſs to the refrigeratory. The ſame object may be more conveniently attained by managing the fire with caution and addreſs. The greater the ſurface expoſed, and the leſs the height the vapours have to aſcend, the more rapidly does the diſtillation proceed; and ſo well are theſe principles underſtood by the Scotch diſtillers, that they do not take more than three minutes to diſcharge a ſtill containing 50 gallons of fluid.

445. The condenſing apparatus uſed with the common ſtill is very ſimple. The tube in which the head terminates, is inſerted into the upper end of a pipe, which is kept cool by paſſing through a veſſel filled with water, called the Refrigeratory. This pipe is commonly made of a ſerpentine form; but as this renders it difficult to be cleaned, Dr Black recommends a ſigmoid pipe. The refrigeratory may be furniſhed with a ſtop-cock, that when the water it contains becomes too hot, and does not condenſe all the vapour produced, it may be changed for cold water. From the lower end of the pipe, the product of the diſtillation drops into the veſſel deſtined to receive it; and we may obſerve, that when any vapour

iſſues along with it, we ſhould either diminiſh the power of the fire, or change the water in the refrigeratory.

446. *Circulation* was a proceſs formerly in uſe. It conſiſted in arranging the apparatus, ſo that the vapours were no ſooner condenſed into a fluid form, than this fluid returned back into the diſtilling veſſels, to be again vaporized; and was effected by diſtilling in a glaſs veſſel, with ſo long a neck that the vapours were condenſed before they eſcaped at the upper extremity, or by inverting one matraſs within another.

447. When corroſive ſubſtances are diſtilled in this way, the cucurbit and alembic are uſed; but theſe ſubſtances are more conveniently diſtilled *per latus.*

448. The diſtillation *per latus* is performed in a retort, or pear-ſhaped veſſel having the neck bent to one ſide. The body of a good retort is well rounded, uniform in its appearance, and of an equal thickneſs, and the neck is ſufficiently bent to allow the vapours, when condenſed, to run freely away, but not ſo much as to render the application of the receiver inconvenient, or to bring it too near the furnace. The paſſage from the body into the neck muſt be perfectly free and ſufficiently wide, otherwiſe the vapours produced in the retort only circulate in its body, without paſſing over into the receiver. For introducing liquors into the retort without ſoiling its neck, which would injure the product, a bent funnel is neceſſary. It muſt be ſufficiently long to introduce the liquor directly into the body of the retort; and in withdrawing it, we muſt carefully keep it applied to the upper part of the retort, that the drop hanging from it may not touch the inſide of the neck. In ſome caſes, where a mixture of different ſubſtances is to be diſtilled, it is convenient and neceſſary to have the whole apparatus properly adjuſted before the mixture is made, and we muſt therefore employ a tubulated retort, or a retort furniſhed with an aperture, accurately cloſed with a ground ſtopper.

449. The tubulature ſhould be placed on the upper convex part of the retort before it bends to form the neck, ſo that a fluid poured through it may fall directly into the body without ſoiling the neck.

450. Retorts are made of various materials. Flint-glaſs is commonly uſed when the heat is not ſo great as to melt it. For diſtillations which require exceſſive degrees of heat, retorts of earthenware, or coated (376. *d.*) glaſs retorts are employed. Quickſilver is diſtilled in iron-retorts.

451. The ſimpleſt condenſing apparatus uſed with the retort, is the common glaſs-receiver; which is a veſſel of a conical or globular form, having a neck ſufficiently wide to admit of the neck of the retort being introduced within it. To prevent the loſs and diſſipation of the vapours to be condenſed, the retort and receiver

may be accurately ground to each other, or ſecured by ſome proper lute. To prevent the receiver from being heated by the caloric evolved during the condenſation of vapours in it, we muſt employ ſome means to keep it cool. It is either immerſed in cold water, or covered with ſnow, or pounded ice, or a conſtant evaporation is ſupported from its ſurface, by covering it with a cloth, which is kept moiſt by means of the deſcent of water, from a veſſel placed above it, through minute ſyphons or ſpongy worſted threads. But as, during the proceſs of diſtillation, permanently elaſtic fluids are often produced, which would endanger the breaking of the veſſels, theſe are permitted to eſcape either through a tubulature, or hole in the ſide of the receiver, or rather through a hole made in the luting (380.). Receivers having a ſpout iſſuing from their ſide, are uſed when we wiſh to keep ſeparate the products obtained at different periods of any diſtillation. For condenſing very volatile vapours, a ſeries of receivers, communicating with each other, termed Adopters, were formerly uſed; but theſe are now entirely ſuperſeded by Woulfe's apparatus.

452. This apparatus conſiſts of a tubulated retort, adapted to a tubulated receiver. With the tubulature of the receiver, a three-necked bottle is connected by means of a bent tube, the further extremity of which is immerſed, one or more inches, in ſome fluid contained in the bottle. A ſeries of two or three ſimilar bottles are connected with this firſt bottle in the ſame way. In the middle tubulature of each bottle, a glaſs tube is fixed, having its lower extremity immerſed about a quarter of an inch in the fluid. The height of the tube above the ſurface of the fluid muſt be greater than the ſum of the columns of fluid ſtanding over the further extremities of the connecting tubes, in all the bottles or veſſels more remote from the retort. Tubes ſo adjuſted are termed Tubes of Safety, for they prevent that reflux of fluid from the more remote into the nearer bottles, and into the receiver itſelf, which would otherwiſe inevitably happen, on any condenſation of vapour taking place in the retort, receiver, or nearer bottles. Different contrivances for the ſame purpoſe have been deſcribed by Meſſrs Welter and Burkitt; and a very ingenious mode of connecting the veſſels without lute, has been invented by Citizen Girard, but they would not be eaſily underſtood without plates. The further tubulature of the laſt bottle is commonly connected with a pneumatic apparatus, by means of a bent tube. When the whole is properly adjuſted, air blown into the retort ſhould paſs through the receiver, riſe in bubbles through the fluids contained in each of the bottles, and at laſt eſcape by the bent tube. In the receiver, thoſe products of diſtillation are collected, which are condenſable by cold alone. The firſt bottle is commonly filled with water, and the others with alkaline ſolutions, or other active

fluids; and as the permanently elaſtic fluids produced, are ſucceſſively ſubjected to the action of all of theſe, only thoſe gaſes will eſcape by the bent tube which are not abſorbable by any of them.

Pneumatic Apparatus.

453. The great importance of the elaſtic fluids in modern chemiſtry, has rendered an acquaintance with the means of collecting and preſerving them indiſpenſable.

454. When a gas is produced by any means, it may be received either,

a. Into veſſels abſolutely empty; or,
b. Into veſſels, filled with ſome fluid, on which it exerts no action.

455. The firſt mode (425. *a.*) of collecting gaſes, may be practiſed by means of a bladder, moiſtened ſufficiently to make it perfectly pliable, and then compreſſed ſo as to preſs out every particle of air from its cavity. In this ſtate it may be eaſily filled with any gas. An oiled ſilk bag will anſwer the ſame purpoſe, and is more convenient in ſome reſpects, as it may be made of any ſize or form.

456. Glaſs or metallic veſſels, ſuch as balloons, may alſo be emptied for the purpoſe of receiving gaſes, by fitting them with a ſtop-cock, and exhauſting the air from them by means of an air-pump.

457. But the ſecond mode (425. *b.*) of collecting gaſes is the moſt convenient and common.

458. The veſſels may be filled either,

a. With a fluid lighter; or,
b. Heavier than the gas to be received into it.

459. The former method is ſeldom employed; but if we conduct a ſtream of any gas heavier than atmoſpheric air, ſuch as carbonic acid gas, muriatic acid gas, &c. to the bottom of any veſſel, it will gradually diſplace the air, and fill the veſſel.

460. On the contrary, a gas lighter than atmoſpheric air, ſuch as hydrogen, may be collected in an inverted veſſel by conducting a ſtream of it to the top.

461. But gaſes are moſt commonly collected by conducting the ſtream of gas into an inverted glaſs-jar, or any other veſſel filled with water or mercury. The gas aſcends to the upper part of the veſſel, and diſplaces the fluid. In this way gas may be kept a very long time, provided a ſmall quantity of the fluid be left in the veſ-

ſels, which prevents both the eſcape of the gas, and the admiſſion of atmoſpheric air.

462. The veſſels may be of various ſhapes; but the moſt commonly employed are cylindrical. They may be either open only at one extremity, or furniſhed at the other with a ſtop-cock.

463. The manner of filling theſe veſſels with fluid, is to immerſe them completely in it, with the open extremity directed a little upwards, ſo that the whole air may eſcape from them, and then inverting them with their mouths downwards.

464. For filling them with convenience, a trough or ciſtern is commonly uſed. This either ſhould be hollowed out of a ſolid block of wood or marble; or, if it be conſtructed of wood ſimply, it muſt be well painted or lined with lead or tinned copper. Its ſize may vary very much; but it muſt contain a ſufficient depth of fluid to cover the largeſt tranſverſe diameter of the veſſels to be filled in it. At one end or ſide, there ſhould be a ſhelf for holding the veſſels after they are filled. This ſhelf ſhould be placed about an inch and a half below the ſurface of the fluid, and ſhould be perforated with ſeveral holes, forming the apices of correſponding conical excavations on the lower ſide, through which, as through inverted funnels, gaſeous fluids may be more eaſily introduced into the veſſels placed over them.

465. In general the veſſels uſed with a mercurial apparatus ſhould be ſtronger and ſmaller than thoſe for a water-ciſtern, and we muſt have a variety of glaſs and elaſtic tubes for conveying the gaſes from the veſſels in which they are formed to the funnels under the ſhelf.

466. *Rectification* is the repeated diſtillation of any fluid. When diſtillation renders the fluid ſtronger, or abſtracts water from it, it is termed *Dephlegmation.* When a fluid is diſtilled off from any ſubſtance, it is called *Abſtraction;* and if the product be rediſtilled from the ſame ſubſtance, or a freſh quantity of the ſame ſubſtance, it is denominated *Cohobation.*

467. *Sublimation* differs from diſtillation only in the form of the product. When it is compact, it is termed a Sublimate; when looſe and ſpongy, it formerly had the improper appellation of Flowers. Sublimation is ſometimes performed in a crucible, and the vapours are condenſed in a paper cone, or in another crucible inverted over it; ſometimes in the lower part of a glaſs flaſk, cucurbit or phial, and the condenſation is effected in the upper part or capital, and ſometimes in a retort with a very ſhort and wide neck, to which a conical receiver is fitted. The heat is moſt commonly applied through the medium of a ſand-bath; and the degree of heat, and the depth to which the veſſel is inſerted in it, are regulated by the nature of the ſublimation.

468. *Congelation* is the reduction of a fluid to a ſolid form, in

conſequence of the abſtraction of caloric. The means employed for abſtracting the caloric, are the evaporation of volatile fluids, the ſolution of ſolids, and the contact of cold bodies.

469. *Coagulation* is the converſion of a fluid into a ſolid of greater or leſs conſiſtence, merely in conſequence of a new arrangement of its particles, as during the proceſs there is no ſeparation of caloric or any other ſubſtance. The means of producing coagulation, are increaſe of temperature, and the addition of certain ſubſtances, as acids and runnets.

COMBINATION.

470. Chemical combination is the intimate union of the particles of at leaſt two heterogeneous bodies. It is the effect reſulting from the exertion of the attraction of affinity, and is therefore ſubjected to all the laws of affinity.

471. To produce the chemical union of any bodies, it is neceſſary,

1. That they poſſeſs affinity for each other.
2. That their particles come into actual contact.
3. That the ſtrength of the affinity be greater than any counteracting cauſes which may be preſent.

472. The principal counteracting cauſes are,

1. The attraction of aggregation.
2. Affinities for other ſubſtances.

473. The means to be employed for overcoming the action of other affinities will be treated of under Decompoſition.

474. The attraction of aggregation is overcome by means of

1. Mechanical diviſion.
2. The action of caloric.

475. Combination is facilitated by increaſing the points of actual contact,

1. By mechanical agitation.
2. By condenſation; compreſſion.

476. The proceſſes employed for producing combination, may be conſidered,

1. With regard to the nature of the ſubſtances combined; and,
2. To the nature of the compound produced.

Gaſes,

1. Combine with gaſes;
2. And diſſolve fluids or ſolids;
2. Or are abſorbed by them.

Fluids,

1. Are diſſolved in gaſes;
2. Or abſorb them.
3. Combine with fluids,
4. And diſſolve ſolids;
5. Or are rendered ſolid by them.

Solids,

1. Are diſſolved in fluids and in gaſes; or
2. Abſorb gaſes,
3. And ſolidify fluids.

477. The combination of gaſes with each other, in ſome inſtances, takes place when ſimply mixed together: thus nitrous and oxygen gaſes combine as ſoon as they come into contact; in other inſtances, it is neceſſary to elevate their temperature to a degree ſufficient for their inflammation, either by means of the electric ſpark, or the contact of an ignited body, as in the combination of oxygen gas with hydrogen or nitrogen gas.

478. When gaſes combine with each other, there is always a conſiderable diminution of bulk, and not unfrequently they are condenſed into a liquid or ſolid form. Hydrogen and oxygen gaſes form water; muriatic acid and ammonia gaſes form ſolid muriate of ammonia. But when the combination is effected by ignition, a violent expanſion, which endangers the burſting of the veſſels, previouſly takes place, in conſequence of the increaſe of temperature.

479. *Solution* is the diminution of aggregation in any ſolid or fluid ſubſtance, in conſequence of its entering into chemical combination. The ſubſtance, whether ſolid or fluid, whoſe aggregation is leſſened, is termed the Solvend; and the ſubſtance, by whoſe agency the ſolution is effected, is often called the Menſtruum or Solvent.

480. Solution is ſaid to be performed *viâ humidâ*, when the natural form of the ſolvent is fluid; but when the agency of heat is neceſſary to give the ſolvent its fluid form, the ſolution is ſaid to be performed *viâ ſiccâ*.

481. The diſſolving power of each menſtruum is limited, and is determinate with regard to each ſolvend. The ſolubility of

bodies is alſo limited and determinate with regard to each menſtruum.

482. When any menſtruum has diſſolved the greateſt poſſible quantity of any ſolvend, it is ſaid to be ſaturated with it. But, in ſome caſes, although ſaturated with one ſubſtance, it is ſtill capable of diſſolving others. Thus a ſaturated ſolution of muriate of ſoda will diſſolve a certain quantity of nitrate of potaſs, and after that a portion of muriate of ammonia.

483. The diſſolving power of ſolvents, and conſequently the ſolubility of ſolvends, are generally increaſed by increaſe of temperature: and converſely, this power is diminiſhed by diminution of temperature; ſo that, from a ſaturated ſolution, a ſeparation of a portion of the ſolvend generally takes place on any reduction of temperature. This property becomes extremely uſeful in many chemical operations, eſpecially in cryſtallization.

484. Particular terms have been applied to particular caſes of ſolution.

485. The ſolution of a fluid in the atmoſphere is termed *ſpontaneous evaporation*. It is promoted by expoſing a large ſurface, by frequently renewing the air in contact with the ſurface, and by increaſe of temperature.

486. Some ſolids have ſo ſtrong an affinity for water, that they attract it from the atmoſphere in ſufficient quantity to diſſolve them. Theſe are ſaid to *deliqueſce*. Others, on the contrary, retain their water of cryſtallization with ſo weak a force, that the atmoſphere attracts it from them, ſo that they crumble into powder. Theſe are ſaid to *effloreſce*. Both operations are promoted by expoſing large ſurfaces, and by a current of air; but the latter is facilitated by a warm dry air, and the former by a cold humid atmoſphere.

487. Solution is alſo employed to ſeparate ſubſtances, (for example, ſaline bodies), which are ſoluble in the menſtruum, from others which are not. When our object is to obtain the ſoluble ſubſtance in a ſtate of purity, the operation is termed *lixiviation*, and as ſmall a quantity of the menſtruum as is poſſible is uſed. When, however, it is employed to free an inſoluble ſubſtance from ſoluble impurities, it is termed *edulcoration*, which is beſt performed by uſing a very large quantity of the menſtruum.

488. Organic products being generally compoſed of heterogeneous ſubſtances, are only partially ſoluble in the different menſtrua. To the ſolution of any of theſe ſubſtances, while the others remain undiſſolved, the term *extraction* is applied; and when, by evaporation, the ſubſtance extracted is reduced to a ſolid form, it is termed an Extract, which is hard or ſoft, watery or ſpiritous, according to the degree of conſiſtency it acquires, and the nature of the menſtruum employed.

489. *Infuſion* is employed to extract the virtues of aromatic and volatile ſubſtances, which would be diſſipated by decoction, and deſtroyed by maceration, and to ſeparate ſubſtances of eaſy ſolution from others which are leſs ſoluble. The proceſs conſiſts in pouring upon the ſubſtance to be infuſed, placed in a proper veſſel, the menſtruum, either hot or cold, according to the direction, covering it up, agitating it frequently, and after a due time ſtraining or decanting off the liquor, which is now termed the Infuſion.

1 0, *Maceration* differs from infuſion, in being continued for a longer time, and can only be employed for ſubſtances which do not eaſily ferment or ſpoil.

491. *Digeſtion*, on the other hand, differs from maceration only in the activity of the menſtruum being promoted by a gentle degree of heat. It is commonly performed in a glaſs matraſs, which ſhould only be filled one third, and covered with a piece of wet bladder, pierced with one or more ſmall holes, ſo that the evaporation of the menſtruum may be prevented as much as poſſible, without riſk of burſting the veſſel. The veſſel may be heated, either by means of the ſun's rays, of a common fire, or of the ſand-bath; and when the laſt is employed, the veſſel ſhould not be ſunk deeper in the ſand than the portion that is filled. Sometimes when the menſtruum employed is valuable, a diſtilling apparatus is uſed to prevent any waſte of it. At other times, a blind capital is luted on the matraſs, or a ſmaller matraſs is inverted within a larger one; and as the vapour which ariſes is condenſed in it, and runs back into the larger, the proceſs in this form has got the name of *Circulation*.

492. *Decoction* is performed by ſubjecting the ſubſtances operated on to a degree of heat which is ſufficient to convert the menſtruum into vapour, and can only be employed with advantage for extracting principles which are not volatile, and from ſubſtances whoſe texture is ſo denſe and compact as to reſiſt the leſs active methods of ſolution. When the menſtruum is valuable, that portion of it which is converted into vapour, is generally ſaved by condenſing it in a diſtilling apparatus (441.)

493. Solutions in alcohol are termed Tinctures, and in vinegar or wine, Medicated vinegars or wines. The ſolution of metals in mercury is termed Amalgamation. The combinations of other metals with each other form Alloys.

494. *Abſorption* is the condenſation of a gas into a fluid or ſolid form, in conſequence of its combination with a fluid or ſolid. It is facilitated by increaſe of ſurface and agitation; and the power of abſorption in fluids is much increaſed by compreſſion and diminution of temperature, although in every inſtance it be limited and determinate. Dr. Nooth invented an ingenious apparatus for com-

bining gaſes with fluids, and Meſſrs. Schweppe, Paul and Cuthbertſon have very advantageouſly employed compreſſion.

495. Fluids often become ſolid by entering into combination with ſolids, and this change is always accompanied by conſiderable increaſe of temperature, as in the ſlaking of lime.

DECOMPOSITION.

496. *Decompoſition* is the ſeparation of bodies which were chemically combined.

497. It can only be effected by the agency of ſubſtances poſſeſſing a ſtronger affinity for one or more of the conſtituents of the compound, than theſe poſſeſs for each other.

498. Decompoſition has acquired various appellations, according to the phenomena which accompany it.

499. *Diſſolution* differs from ſolution in being accompanied by the decompoſition, or a change in the nature of the ſubſtance diſſolved. Thus, we correctly ſay, a ſolution of lime in muriatic acid, and a diſſolution of chalk in muriatic acid.

500. Sometimes a gas is ſeparated during the action of bodies on each other. When this eſcapes with conſiderable violence and agitation of the fluid, it is termed *effervеſcence.* The gas is very frequently allowed to eſcape into the atmoſphere, but at other times is either collected in a pneumatic apparatus, or made to enter into ſome new combination. The veſſels in which an effervеſcing mixture is made, ſhould be high and ſufficiently large, to prevent any loſs of the materials from their running over, and in ſome caſes the mixture muſt be made ſlowly and gradually.

501. *Precipitation* is the reverſe of ſolution. It comprehends all thoſe proceſſes in which a ſolid is obtained by the decompoſition of a ſolution. The ſubſtance ſeparated is termed a Precipitate, if it ſink to the bottom of the fluid; or a Cream, if it ſwim above it. Precipitation, like ſolution, is performed either *viâ humidâ*, or *viâ ſiccâ* (479.)

502. Precipitation is effected,

1. By leſſening the quantity of the ſolvent by evaporation.
2. By diminiſhing its powers, as by reduction of temperature, or dilution.
3. Or by the addition of ſome chemical agent, which from its more powerful affinities,
   - *a.* Either combines with the ſolvent, and precipitates the ſolvend;
   - *b.* Or forms itſelf an inſoluble compound with ſome conſtituent of the ſolution.

503. The objects of precipitation are,

1. The ſeparation of ſubſtances from ſolutions in which they are contained.
2. The purification of ſolutions from precipitable impurities.
3. The formation of new combinations.

504. The two firſt means of precipitation have been already noticed.

505. In performing it in the laſt manner, we may obſerve the following rules:

1. The ſolution and precipitant muſt poſſeſs the requiſite degree of purity.
2. The ſolution ſhould be perfectly ſaturated, to avoid unneceſſary expenditure of the ſolvent or precipitant.
3. The one is to be added ſlowly and gradually to the other.
4. After each addition, they are to be thoroughly mixed by agitation.
5. We muſt allow the mixture to ſettle, after we think that enough of the precipitant has been added, and try a little of the clear ſolution, by adding to it ſome of the precipitant; if any precipitation takes place, we have not added enough of the precipitant. This is neceſſary, not only to avoid loſs, but in many inſtances, the precipitant, if added in exceſs, re-diſſolves or combines with the precipitate.

506. After the precipitation is completed, the precipitate is to be ſeparated from the ſupernatant fluid by ſome of the means already noticed.

507. When the precipitate is the chief object of our proceſs, and when it is not ſoluble in water, it is often adviſable to dilute, to a conſiderable degree, both the ſolution and precipitant, before performing the operation. When it is only difficultly ſoluble, we muſt content ourſelves with waſhing the precipitate, after it is ſeparated by filtration. In ſome caſes the ſeparation of the precipitate is much aſſiſted by a gentle heat.

508. *Cryſtallization* is a ſpecies of precipitation, in which the particles of the ſolvend, on ſeparating from the ſolution, aſſume certain determinate forms.

509. The conditions neceſſary for cryſtallization are,

1. That the integrant particles have a tendency to arrange themſelves in a determinate manner, when acted on by the attraction of aggregation.
2. That they be diſaggregated, at leaſt ſo far as to poſſeſs ſufficient mobility to aſſume their peculiar arrangement.

3. That the cauſes diſaggregating them be ſlowly and gradually removed.

510. Notwithſtanding the immenſe variety in the forms of cryſtals, M. Hauy has rendered it probable, that there are only three forms of the integrant particles:

1. The parallelopiped.
2. The triangular priſm.
3. The tetrahedron.

511. But as theſe particles may unite in different ways, either by their faces or edges, they will compoſe cryſtals of various forms.

512. The primitive forms have been reduced to ſix;

1. The parallelopiped.
2. The regular tetrahedron.
3. The octahedron with triangular faces.
4. The ſix-ſided priſm.
5. The dodecahedron terminated by rhombs.
6. The dodecahedron with iſoſcles triangular faces.

513. Almoſt all ſubſtances, on cryſtallizing, retain a portion of water combined with them, which is eſſential to their exiſtence as cryſtals, and is therefore denominated Water of cryſtallization. Its quantity varies very much in different cryſtallized ſubſtances.

514. The means by which the particles of bodies are diſaggregated, ſo as to admit of cryſtallization, are ſolution, fuſion, vaporization, or mechanical diviſion and ſuſpenſion in a fluid medium.

515. The means by which the diſaggregating cauſes are removed, are, evaporation, reduction of temperature, and reſt.

516. When bodies are merely ſuſpended in a ſtate of extreme mechanical diviſion, nothing but reſt is neceſſary for their cryſtallization.

517. When they are diſaggregated by fuſion or vaporization, the regularity of their cryſtals depends on the ſlowneſs with which their temperature is reduced; for if cooled too quickly, their particles have not time to arrange themſelves, and are converted at once into a confuſed or unvaried ſolid maſs. Thus glaſs, which when cooled quickly, is ſo perfectly uniform in its appearance, when cooled ſlowly has a cryſtalline texture. But in order to obtain cryſtals by means of fuſion, it is often neceſſary, after the ſubſtance has begun to cryſtallize, to remove the part which remains fluid, for otherwiſe it would fill up the interſtices among the cryſtals firſt formed, and give the whole the appearance of one ſolid maſs. Thus, after a cruſt has formed on the top of melted

ſulphur, by pouring off the ſtill fluid part, we obtain regular cryſtals.

518. The means by which bodies, which have been diſaggregated by ſolution, are made to cryſtallize moſt regularly, vary according to the habitudes of the bodies with their ſolvents and caloric.

519. Some ſaline ſubſtances are much more ſoluble in hot than in cold water. Therefore a boiling ſaturated ſolution of any of theſe will depoſite, on cooling, the exceſs of ſalt, which it is unable to diſſolve when cold. Theſe ſalts commonly contain much water of cryſtallization.

520. Other ſalts are ſcarcely, if at all, more ſoluble in hot than in cold water; and, therefore, their ſolutions muſt be evaporated either by heat or ſpontaneouſly. Theſe ſalts commonly contain little water of cryſtallization.

521. The beauty and ſize of the cryſtals depend upon the purity of the ſolution, its quantity, and the mode of conducting the evaporation, and cooling.

522. When the ſalt is not more ſoluble in hot than in cold water, by means of gentle evaporation a ſucceſſion of pellicles are formed on the top of the ſolution, which either are removed or permitted to ſink to the bottom by their own weight; and the evaporation is continued until the cryſtallization be completed.

523. But when the ſalt is capable of cryſtallizing on cooling, the evaporation is only continued until a drop of the ſolution, placed upon ſome cold body, ſhews a diſpoſition to cryſtallize, or at fartheſt only until the firſt appearance of a pellicle. The ſolution is then covered up, and ſet aſide to cool, and the more ſlowly it cools, the more regular are the cryſtals. The mother-water or ſolution, which remains after the cryſtals are formed, may be repeatedly treated in the ſame way as long as it is capable of furniſhing any more ſalt.

524. When very large and beautiful cryſtals are wanted, they may be obtained by laying well-formed cryſtals in a ſaturated ſolution of the ſame ſalt, and turning them every day. In this way their ſize may be conſiderably increaſed, though not without limitation, for after a certain time they grow ſmaller inſtead of larger.

525. Cryſtallization is employed,

1. To obtain cryſtallizable ſubſtances in a ſtate of purity.
2. To ſeparate them from each other, by taking advantage of their different ſolubility at different temperatures.

OXYGENIZEMENT.

526. The combination of oxygen is the object of many chemical and pharmaceutical proceſſes.

527. With regard to the manner of combination, the oxygenizement may take place either

a. Without the production of heat and light, to expreſs which there is no other than the generic term *oxygenizement*; or

b. With the production of heat and light, *combuſtion.*
  1. In ſubſtances which remain fixed at the temperature neceſſary for their combuſtion, there is no other more ſpecific term.
  2. In ſubſtances which exiſt as gaſes, or are previouſly reduced to the ſtate of vapour by the temperature neceſſary, it is termed *inflammation*; and if it proceed with very great violence and rapidity, *deflagration.*

528. Combuſtion and inflammation have been already deſcribed.

529. *Deflagration* from its violence muſt always be performed with caution. The common mode of conducting this proceſs, is to introduce the ſubſtances to be deflagrated together into any convenient veſſel, commonly an iron pot, or crucible, heated to redneſs. But to obviate any inconvenience, and to enſure the ſucceſs of the proceſs, they are previouſly made perfectly dry, reduced to powder, and thoroughly mixed together, and they are deflagrated gradually, for example, by ſpoonfuls; but we muſt take care always to examine the ſpoon, leſt a ſpark ſhould adhere to it, which might ſet fire to the whole maſs. During the proceſs, the portion introduced ſhould be frequently ſtirred.

530. The oxygen neceſſary for the proceſſes, may be derived from the decompoſition

a. Of oxygen gas or atmoſpheric air.
b. Of oxides, particularly water.
c. Of acids and their combinations, eſpecially the oxygenized muriatic and nitric acids.

531. The different modes of oxygenizement are intended, either

a. To produce heat and light.
b. To obtain an oxygenized product:
  1. An oxide, when the proceſs may be termed *Oxidizement.*
  2. An acid, *Acidification.*
c. To remove an oxygenizable ſubſtance.

532. Hydrogen, carbon, and nitrogen, are never unleſs, for experiment, oxygenized as ſimple ſubſtances.

533. Sulphur is converted into ſulphuric acid by burning it in leaden chambers, or by deflagrating it with nitrate of potaſs; and phoſphorus is acidified by inflammation in the atmoſphere.

534. Of all the ſimple oxygenizable ſubſtances, the metals are moſt frequently combined with oxygen; and as, in conſequence of this combination, they loſe their metallic appearance, they were formerly ſaid to be calcined or corroded.

535. Metals differ very much in the facility with which they are oxygenized by the contact of oxygen gas. For ſome, as iron and manganeſe, the ordinary temperature of the atmoſphere is ſufficient; others, as gold and platinum, ſcarcely undergo any change in the moſt violent heat. The operation is performed by heating them to the requiſite temperature, and expoſing them to the action of the air; and on the fuſible metals it is promoted by ſtirring them when melted.

536. Metals alſo differ in the mode of their action upon water. They are either capable of decompoſing water,

- *a.* At ordinary temperatures, as iron, zinc, manganeſe, &c.
- *b.* At elevated temperatures, as antimony and tin; or,
- *c.* When acted upon at the ſame time by an acid or an alkali, as copper, lead, biſmuth; or, laſtly,
- *d.* They are incapable of decompoſing it, as gold, ſilver, mercury, platinum.

537. The oxygenizement of metals by water is promoted by the action of air. Iron, for example, is more quickly ruſted by being merely moiſtened with water, than when totally immerſed in water.

538. But the acids are the moſt powerful agents in oxygenizing metals. They do it in two ways, either

1. By enabling them to decompoſe water (226. S. 2.)
2. By being decompoſed themſelves.

539. Sulphuric acid is decompoſed by very few metals, unleſs aſſiſted by conſiderable increaſe of temperature; but it powerfully promotes the decompoſition of water.

540. Nitric acid is decompoſed by many of them with very great violence, proceeding in ſome inſtances even to inflammation. It alſo oxygenizes them to the higheſt degree of which they are ſuſceptible. It ſeldom produces the decompoſition of water.

541. Muriatic acid is never decompoſed, and only acts on thoſe metals capable of decompoſing water.

542. Oxygenized muriatic acid reſembles the nitric, both in the violence of its action, and in the extent to which it carries the oxygenizement of the metals.

543. The metals are ſuſceptible of different degrees of oxygenizement, ſome of them even of acidification, and, in general, they are more oxygenized according to the rapidity of the proceſs. When proceeding too ſlowly, it may be accelerated by heat; when too violent, it muſt be checked by diminution of temperature, as by plunging the veſſel in which the operation is performing into cold water.

544. When the degree of oxygenizement is not very great, the oxide formed, generally enters into combination with the acid employed, and forms a metallic ſalt; but when carried to its higheſt degree, the oxide is often inſoluble.

DISOXYGENIZEMENT of METALLIC OXIDES and ACIDS.

545. This proceſs was formerly termed *reduction*, from its reſtoring them to their metallic ſplendour; and is performed by cauſing ſome body to act upon them, which has a greater affinity for oxygen than they have. The different metals themſelves vary very much in the degree of this affinity, ſo that they are reduced with very different degrees of facility. Gold, ſilver, platinum, and mercury, are reduced by merely expoſing them to a ſufficient degree of heat in cloſe veſſels. The oxygen at this temperature has a greater affinity for caloric than for the metals, and is therefore driven off in the form of very pure oxygen gas.

546. The other metallic oxides which reſiſt the ſimple action of heat, may be reduced by melting them in contact with charcoal, or ſubſtances which may be charred ſuch as oil, fat, roſin, pitch, &c. Beſides the charcoal, different ſaline fluxes, are alſo added to facilitate the fuſion of the oxide.

547. The oxide to be reduced is mixed with a ſufficient quantity of any of theſe ſubſtances, and placed in the bottom of a crucible, which is afterwards filled up with charcoal powder, to prevent entirely the acceſs of the air, and expoſed for a length of time to a ſufficiently high temperature, when a button of the metal will commonly be found in the bottom of the crucible. Upon the volatile metals, ſuch as arſenic and zinc, this operation muſt be performed in a diſtilling or ſubliming apparatus. Some metallic oxides, ſuch as thoſe of platinum, columbium, &c. cannot be reduced, from our being unable to produce a degree of heat ſufficient to melt them.

548. Metals may be alſo obtained from the metallic ſalts, by inſerting in a ſolution of theſe a plate of another metal, poſſeſſing a ſtronger affinity for oxygen and for the acid. Thus copper is precipitated by iron, and arſenic by zinc. We muſt only take care that the two metals have no remarkable affinity for each other, as in that caſe an alloy is commonly produced. For example, when

mercury is placed in a ſolution of ſilver, a cryſtallized amalgam of ſilver is obtained, formerly called the Arbor Dianæ.

549. The compound oxides may be further oxygenized, by treating them with nitric acid. In this way various acids are formed, according to the nature of the oxide operated on, the quantity of the acid, and the mode of conducting the proceſs.

550. They alſo undergo changes by gradually combining with the oxygen of the atmoſphere. In ſome caſes, this combination is attended with remarkable phenomena, which have been claſſed under the term *fermentation.*

551. There are ſeveral ſpecies of fermentation, which have been named from the products they afford.

1. The ſaccharine, which produces ſugar.
2. The vinous, which produces wine, beer, and ſimilar fluids.
3. The panary, which produces bread.
4. The acetous, which produces vinegar.
5. The putrefactive, which produces ammonia.

552. The ſame ſubſtances are ſometimes capable of undergoing the firſt, ſecond, fourth, and fifth; or third, fourth, and fifth, ſucceſſively, but never in a retrograde order.

553. The conditions neceſſary for all of them, are,

1. The preſence of a ſufficient quantity of fermentable matter.
2. The preſence of a certain proportion of water.
3. The contact of atmoſpheric air; and,
4. A certain temperature.

554. *The ſaccharine fermentation.*—The ſeeds of barley, when moiſtened with a certain quantity of water, and expoſed to the contact of the atmoſpheric air, at a temperature of not leſs than 50°, ſwell, and ſhew marks of incipient vegetation, by puſhing forth the radicle. If at this period the fermentation be checked, by expoſing them to a conſiderable degree of heat, and drying them thoroughly, the inſipid amylaceus matter, of which the ſeeds principally conſiſted, will be found to be changed in part into a ſweet ſaccharine ſubſtance. The oxygen of the air, in contact with the ſeeds, is at the ſame time converted into carbonic acid gas, by combining with part of the carbon of the ſeeds; and there is a conſiderable increaſe of temperature in the fermenting maſs, even to ſuch a degree as ſometimes to ſet it on fire. Similar phenomena occur in the maturation of fruits, in the cookery of ſome roots and fruits, and during the heating of hay, when put up too wet.

555. *The vinous fermentation.*—The conditions neceſſary for the vinous fermentation, are the preſence of proper proportions of

ſugar, acid, extract, and water, and a temperature of about 70°. When theſe circumſtances exiſt, an inteſtine motion commences in the fluid; it becomes thick and muddy; its temperature increaſes, and carbonic acid gas is evolved. After a time the fermentation ceaſes; the feces riſe to the top, or ſubſide to the bottom; the liquor becomes clear; it has loſt its ſaccharine taſte, and aſſumed a new one, and its ſpecific gravity is diminiſhed. If the fermentation has been complete, the ſugar is entirely decompoſed, and the fermented liquor conſiſts of a large proportion of water, of alcohol, of malic acid, of extract, of eſſential oil, and colouring matter. The ſubſtances moſt commonly ſubjected to this fermentation, are, Muſt, which is the expreſſed juice of the grape, and which produces the beſt wines; the juice of the currant and gooſeberry, which, with the addition of ſugar, form our home-made wines; the juices of the apple and pear, which give cyder and perry; and an infuſion of malt, which, when fermented with yeaſt, forms beer. The briſkneſs and ſparkling of ſome of theſe liquors, depends on their being put into cloſe veſſels before the fermentation is completed, by which means a portion of carbonic acid gas is retained.

556. *The acetous fermentation.*—All vinous liquors are ſuſceptible of the acetous fermentation, provided they be expoſed to the action of the atmoſphere, in a temperature not leſs than 70°. An inteſtine motion and hiſſing noiſe ſenſibly take place in the fluid; it becomes turbid, with filaments floating in it, and its temperature increaſes; it exhales a pungent acid ſmell, without any diſengagement of carbonic acid gas. Gradually theſe phenomena ceaſe; the temperature decreaſes; the motion ſubſides, and the liquor becomes clear, having depoſited a ſediment and red glairy matter, which adheres to the ſides of the veſſel. During this proceſs, the alcohol and malic acid diſappear entirely, oxygen is abſorbed, and acetous acid formed.

557. *The panary and colouring fermentation*—is leſs underſtood than thoſe already deſcribed. A paſte of wheat flour and water expoſed at a temperature of 65°, ſwells, emits a ſmall quantity of gas, and acquires new properties. The gluten diſappears, and it acquires a ſour diſagreeable taſte. If a juſt proportion of this fermented paſte or leaven, or, what is ſtill better, if ſome barm be formed into a paſte with wheat-flour and water, the ſame fermentation is excited, without the diſagreeable taſte being produced; the gas evolved is prevented from eſcaping by the viſcidity of the paſte, which therefore ſwells, and, if baked, forms light, ſpongy bread.

558. *The putrefactive fermentation.*—Although vegetable ſubſtances, when they are deſtroyed by ſpontaneous decompoſition, are ſaid to putrify, we ſhall conſider this fermentation as belonging

exclufively to animal fubftances, or thofe which contain nitrogen as an elementary principle. The effential conditions of putrefaction are humidity, and a temperature between 45° and 110°. The prefence of air, the diminution of preffure, and the addition of ferments, are not effential, but accelerate its progrefs. The fmell is at firft infipid and difagreeable, but afterwards infupportably fetid, although the fetor for a time is fomewhat diminifhed by the mixture of an ammoniacal odour. Liquids become turbid and flocculent. Soft fubftances melt down into a gelatinous mafs, in which there is a kind of gentle motion and fwelling up, from the flow and fcanty formation of elaftic fluids. Solids, befides the general foftening, exude a ferofity of various colours, and by degrees the whole mafs diffolves, the fwelling ceafes, the matter fettles, and its colour deepens; at laft its odour becomes fomewhat aromatic, its elements are finally diffipated, and there remains only a kind of fat, vifcid, and ftill fetid mould. The products of putrefaction are carburetted, fulphuretted, and phofphuretted hydrogen gafes, water, ammonia, azote, and carbonic acid. Thefe are all diffipated in the form of gas or vapour. When in contact with air, oxygen is abforbed. Acetic acid, a fatty matter, a foap compofed of this fat and ammonia, and often the nitric acid, fixed by a falifiable bafe, are alfo produced; and the ultimate remains, befides falts, compofed of acid and earths, contain for a long time a portion of fat charry matter.

APPENDIX.

TABLES OF SIMPLE AFFINITY.

OXYGEN.

Carbon,
Charcoal,
Manganeſe,
Zinc,
Iron,
Tin,
Antimony,
Hydrogen,
Phoſphorus,
Sulphur,
Arſenic,
Nitrogen,
Nickel,
Cobalt,
Copper,
Biſmuth,
Caloric?
Mercury,
Silver,
Arſenious acid,
Nitric oxide,
Gold,
Platinum,
Carbonic oxide,
Muriatic acid,
White oxide of Manganeſe,
White oxide of Lead.

OXYGEN. [a]

Titanium,
Manganeſe,
Zinc,
Iron,
Tin,
Uranium,
Molybdenum,
Tungſten,
Cobalt,
Antimony,
Nickel,
Arſenic,
Chromum,
Biſmuth,
Lead,
Copper,
Tellurium,
Platinum,
Mercury,
Silver,
Gold.

CARBON.

Oxygen,
Iron,
Hydrogen.

NITROGEN.

Oxygen,
Sulphur?
Phoſphorus,
Hydrogen.

HYDROGEN.

Oxygen,
Sulphur,
Carbon,
Phoſphorus,
Nitrogen.

SULPHUR. PHOSPHORUS?

Potaſs,
Soda,
Iron,
Copper,
Tin,
Lead,
Silver,
Biſmuth,
Antimony,
Mercury,
rſenic,
Molybdenum.

POTASS, SODA, AND AMMONIA.

Acids. Sulphuric,
—— Nitric,
—— Muriatic,
—— Phoſphoric,
—— Fluoric,
—— Oxalic,
—— Tartaric,
—— Arſenic,
—— Succinic,
—— Citric,
—— Lactic,
—— Benzoic,
—— Sulphurous,
—— Acetic,
—— Mucic,
—— Boracic,
—— Nitrous,
—— Carbonic,
—— Pruſſic,
Oil,
Water,
Sulphur.

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[a] Vauquelin's Table of the affinity of the metals for oxygen, according to the difficulty with which their oxides are decompoſed by heat.

TABLES OF SIMPLE AFFINITY CONTINUED.

BARYTA.

Acids. Sulphuric,
—— Oxalic,
—— Succinic,
—— Fluoric,
—— Phoſphoric,
—— Mucic,
—— Nitric,
—— Muriatic,
—— Suberic,
—— Citric,
—— Tartaric,
—— Arſenic,
—— Lactic,
—— Benzoic,
—— Acetic,
—— Boracic,
—— Sulphurous,
—— Nitrous,
—— Carbonic,
—— Pruſſic,
Sulphur,
Phoſphorus,
Water,
Fixed oil.

STRONTIA.

Acids. Sulphuric,
—— Phoſphoric,
—— Oxalic,
—— Tartaric,
—— Fluoric,
—— Nitric,
—— Muriatic,
Acids. Succinic,
—— Acetic,
—— Arſenic,
—— Boracic,
—— Carbonic,
Water.

LIME.

Acids. Oxalic,
—— Sulphuric,
—— Tartaric,
—— Succinic,
—— Phoſphoric,
—— Mucic,
—— Nitric,
—— Muriatic,
—— Suberic,
—— Fluoric,
—— Arſenic,
—— Lactic,
—— Citric,
—— Malic,
—— Benzoic,
—— Acetic,
—— Boracic,
—— Sulphurous,
—— Nitrous,
—— Carbonic,
—— Pruſſic,
Sulphur,
Phoſphorus,
Water,
Fixed oil.

MAGNESIA.

Acids. Oxalic,
—— Phoſphoric,
—— Sulphuric,
—— Fluoric,
—— Arſenic,
—— Mucic,
—— Succinic,
—— Nitric,
—— Muriatic,
—— Tartaric,
—— Citric,
—— Malic ?
—— Lactic,
—— Benzoic,
—— Acetic,
—— Boracic,
—— Sulphurous,
—— Nitrous,
—— Carbonic,
—— Pruſſic,
Sulphur.

ALUMINA.

Acids. Sulphuric,
—— Nitric,
—— Muriatic,
—— Oxalic,
—— Arſenic,
—— Fluoric,
—— Tartaric,
—— Succinic,
—— Mucic,
—— Citric,
Acids. Phoſphoric
—— Lactic,
—— Benzoic,
—— Acetic,
—— Boracic,
—— Sulphur
—— Nitrous,
—— Carbonic
—— Pruſſic.

SILICA.

Fluoric acid,
Potaſs.

OX. OF PLATIN
—— GOLD.

Gallic acid,
Muriatic,
Nitric,
Sulphuric,
Arſenic,
Fluoric,
Tartaric,
Phoſphoric,
Oxalic,
Citric,
Acetic,
Succinic,
Pruſſic,
Carbonic,
Ammonia.

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[a] Omitting the oxalic, citric, ſuccinic, and carbonic, and adding ſulphuretted hydrog after ammonia.

TABLES OF SIMPLE AFFINITY CONTINUED.

Oxide of Silver.

Gallic acid,
Muriatic,
Oxalic,
Sulphuric,
Mucic,
Phoſphoric,
Sulphurous,
Nitric,
Arſenic,
Fluoric,
Tartaric,
Citric,
Lactic,
Succinic,
Acetic,
Pruſſic,
Carbonic,
Ammonia.

Oxide of Mercury.

Gallic acid,
Muriatic,
Oxalic,
uccinic,
Arſenic,
Phoſphoric,
ulphuric,
Mucic,
Tartaric,
Citric,
Malic,
ulphurous,
Nitric,
luoric,
Acetic,
enzoic,

Boracic,
Pruſſic,
Carbonic.

Oxide of Lead.

Gallic,
Sulphuric,
Mucic,
Oxalic,
Arſenic,
Tartaric,
Phoſphoric,
Muriatic,
Sulphurous,
Suberic,
Nitric,
Fluoric,
Citric,
Malic,
Succinic,
Lactic,
Acetic,
Benzoic,
Boracic,
Pruſſic,
Carbonic,
Fixed oils,
Ammonia.

Oxide of Copper.

Gallic,
Oxalic,
Tartaric,
Muriatic,
Sulphuric,
Mucic,
Nitric,
Arſenic,

Phoſphoric,
Succinic,
Fluoric,
Citric,
Lactic,
Acetic,
Boracic,
Pruſſic,
Carbonic,
Fixed alkalies,
Ammonia,
Fixed oils.

Oxide of Arsenic.

Gallic,
Muriatic,
Oxalic,
Sulphuric,
Nitric,
Tartaric,
Phoſphoric,
Fluoric,
Succinic,
Citric,
Acetic,
Pruſſic,
Fixed alkalies,
Ammonia,
Fixed oils,
Water.

Oxide of Iron.

Gallic,
Oxalic,
Tartaric,
Camphoric,
Sulphuric,
Mucic,

Muriatic,
Nitric,
Phoſphoric,
Arſenic,
Fluoric,
Succinic,
Citric,
Lactic,
Acetic,
Boracic,
Pruſſic,
Carbonic.

Oxide of Tin [a].

Gallic,
Muriatic,
Sulphuric,
Oxalic,
Tartaric,
Arſenic,
Phoſphoric,
Nitric,
Succinic,
Fluoric,
Mucic,
Citric,
Lactic,
Acetic,
Boracic,
Pruſſic,
Ammonia.

Oxide of Zinc.

Gallic,
Oxalic,
Sulphuric,
Muriatic,
Mucic,

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[a] Bergman places the tartaric before the muriatic.

TABLES OF SIMPLE AFFINITY CONTINUED.

Nitric,
Tartaric,
Phoſphoric,
Citric,
Succinic,
Fluoric,
Arſenic,
Lactic,
Acetic,
Boracic,
Pruſſic,
Carbonic,
Fixed alkalies,
Ammonia.

OX. OF ANTIMONY.

Gallic,
Muriatic,
Benzoic,
Oxalic,
Sulphuric,
Nitric,
Tartaric,
Mucic,
Phoſphoric,
Citric,
Succinic,
Fluoric,
Arſenic,
Lactic,
Acetic,
Boracic,
Pruſſic,
Fixed alkalies,
Ammonia.

SULPHURIC ACID.
PRUSSIC. *a.*

Baryta,
Strontia,
Potaſs,
Soda,
Lime,
Magneſia,
Ammonia,
Glucina,
Gadolina,
Alumina,
Zirconia,
Metallic oxides.

SULPHUROUS ACID.
SUCCINIC. *b.*

Baryta,
Lime,
Potaſs,
Soda,
Strontia,
Magneſia,
Ammonia,
Glucina,
Alumina,
Zirconia,
Metallic oxides.

PHOSPHORIC ACID.
CARBONIC. *c.*

Baryta,
Strontia,
Lime,
Potaſs,
Soda,
Ammonia,
Magneſia,
Glucina,
Alumina,
Zirconia,
Metallic oxides,
Silica.

PHOSPHOROUS ACID.

Lime,
Baryta,
Strontia,
Potaſs,
Soda,
Ammonia,
Glucina,
Alumina,
Zirconia,
Metallic oxides.

NITRIC ACID.
MURIATIC —— *d.*

Baryta,
Potaſs,

Soda,
Strontia,
Lime,
Magneſia,
Ammonia,
Glucina,
Alumina,
Zirconia,
Metallic oxides.

FLUORIC ACID.
BORACIC —— *e*
ARSENIC —— *f.*
TUNGSTIC——

Lime,
Baryta,
Strontia,
Magneſia,
Potaſs,
Soda,
Ammonia,
Glucina,
Alumina,
Zirconia,
Silica.

ACETIC ACID.
LACTIC ——.
SUBERIC —— *g.*

Baryta,
Potaſs,
Soda,
Strontia,

a. With the omiſſion of all after ammonia.

b. Ammonia ſhould come before magneſia, and ſtrontia, glucina and zirconia ſhould be omitted.

c. Magneſia ſhould ſtand above ammonia, and alumina and ſilica ſhould be omitted.

d. Ammonia ſhould ſtand above magneſia.

e. Silica ſhould be omitted, and inſtead of it water and alcohol be inſerted.

f. Except ſilica.

g. With the omiſſion of ſtrontia, metallic oxides, glucina and zirconia.

TABLES OF SIMPLE AFFINITY CONTINUED.

Lime, Ammonia, Magneſia, Metallic oxides, Glucina, Alumina, Zirconia.	**BENZOIC ACID.** White oxide of Arſenic, Potaſs, Soda, Ammonia, Baryta, Lime, Magneſia, Alumina,	**FIXED OIL.** Lime, Baryta, Potaſs, Soda, Magneſia, Oxide of Mercury, Other metallic oxides, Alumina.	**SULPHURETTED HYDROGEN.** Baryta, Potaſs, Soda, Lime, Ammonia, Magneſia, Zirconia.
OXALIC ACID. **TARTARIC** —— **CITRIC** ——[a] Lime, Baryta, Strontia, Magneſia, Potaſs, Soda, Ammonia, Alumina, Metallic oxides, Water, Alcohol.	**CAMPHORIC ACID.** Lime, Potaſs, Soda, Baryta, Ammonia, Alumina, Magneſia.	**ALCOHOL.** Water, Ether, Volatile oil, Alkaline Sulphurets.	

[a] Zirconia after alumina.

CASES OF MUTUAL DECOMPOSITION.

1. From Simple Affinity (20. *a*).

Sulphate of Potaſs,	with	Muriate of Baryta.
Soda,	—	Nitrate of Potaſs.
Ammonia,	—	Muriate of Soda.
Magneſia,	—	Carbonate of Potaſs,
Super-ſulphate of Alumina,	—	Muriate of Lime.
Nitrate of Potaſs,	—	Baryta.
Ammonia,	—	Phoſphate of Soda.
Muriate of Baryta,	—	All the Sulphates and Nitrates.
Soda,	—	Carbonate of Potaſs.
Lime,	—	Sub-borate of Soda.
Ammonia,	—	Carbonate of Potaſs.
Phoſphate of Soda,	—	Muriate of Ammonia.
Sub-borate of Soda,	—	Carbonate of Potaſs.
Nitrate of Silver,	—	Muriate of Soda.
Acetate of Lead,	—	Citrate of Potaſs.
Sulphate of Mercury,	—	Muriate of Soda.
Soap of Potaſs,	—	Muriate of Soda.
Soap of Soda,	—	Sulphate of Lime.

2. From Compound Affinity (20. *b*).

Sulphate of Baryta,	with	Carbonate of Potaſs.
Sulphate of Baryta,	—	Soda.
Potaſs,	—	Muriate of Lime.
Soda,	—	Muriate of Lime.
Muriate of Baryta,	—	Phoſphate of Soda.
	—	Sub-borate of Soda.
	—	Carbonate of Potaſs.
	—	Soda.
	—	Ammonia.
Muriate of Lime,	—	Carbonate of Ammonia.
Phoſphate of Soda,	—	Lime.
Acetate of Lead,	—	Sulphate of Zinc.
Acetate of Lead,	—	Nitrate of Mercury.

CASES OF DISPOSING AFFINITY (20. *c*).

The formation of water by the action of the ſulphuric acid on the compound oxides.

The oxidation of metals by water, in conſequenec of the preſence of an acid.

THERMOMETERS.

Fahrenheit's thermometer is univerſally uſed in this kingdom. In it the range between the freezing and boiling points of water is divided into 180 degrees; and as the greateſt poſſible degree of cold was ſuppoſed to be that produced by mixing ſnow and muriate of ſoda, it was made the zero, and the freezing point became 32°, and the boiling point 212°.

The Centigrade thermometer of Revolutionized France, places the zero at the freezing point, and divides the range between it and the boiling point into 100°. This has long been uſed in Sweden under the title of Celſius's thermometer.

Reameur's thermometer, which was formerly uſed in France, divides the ſpace between the freezing and boiling of water into 80°, and places the zero at the freezing point.

Wedgewood's pyrometer is only intended to meaſure very high temperatures. Its zero correſponds with 1077° of Fahrenheit's, and each degree of Wedgewood is equal to 130 of Fahrenheit.

De Liſle's thermometer is uſed in Ruſſia. The graduation begins at the boiling point, and increaſes towards the freezing point. The boiling point is marked 0, and the freezing point 150.

Therefore $180°\ F. = 100°\ C. = 80°\ R. = 150°\ D. = \frac{18}{13} W.$

Or to reduce centrigrade degrees to thoſe of Fahrenheit, multiply by 9 and divide by 5, and to the quotient add 32, that is, $\frac{9\,C}{5} + 32 = F.$

To reduce Reameur's to Fahrenheit's, we have the following formula, $\frac{9\,R}{4} + 32 = F.$

To reduce De Liſle's degrees under the boiling point, we have $F = 212 - \frac{6\,D}{5}$ to reduce thoſe above the boiling point $F = 212 + \frac{6\,D}{5}.$

To reduce Wedgewood's degrees to thoſe of Fahrenheit, we have $130\ W + 1077 = F$, or inverſely,

$$\frac{5\,F-160}{9} = C. \qquad \frac{4\,F-128}{9} = R. \qquad \frac{F.-1077}{130} = W.$$

$$\frac{1060-5\,F}{6} = D. \qquad \frac{5\,F-1060}{6} = -D.$$

Table *of the Degrees of different Thermometers, omitting Fractions, at which ſome remarkable Chemical Phenomena occur.*

REAU.	FAHR.	CENT.	
54	90	68	Cold produced by Mr. Walker.
44	66	55	Nitric acid freezes Fourcroy.
36	50	44	Cold obſerved at Hudſon's Bay, Mr. M'Nab.
35	46	43	Ether freezes.
34	45	42	Ammonia exiſts in a liquid form.
32	39	39	Mercury freezes.
30	36	37	Sulphuric acid freezes, (Thomſon).
28	31	35	Sulphurous acid liquid, (Monge).
24	23	30	Cold obſerved at Glaſgow on the ſurface of ſnow, 1780.
23	22	30	Acetous acid freezes.
20	14	25	Cold obſerved at Glaſgow, 1780.
19	11	24	Two parts of alcohol and one of water freeze.
17	7	14	Brandy freezes.
14	0	18	Cold, produced by mixing equal parts of ſnow and muriate of ſoda.
7	16	9	Oil of turpentine freezes. Margueron did not freeze at —18 Morelli.
5	20	6	Strong wines freeze.
4	23	5	Fluoric acid freezes, (Prieſtly). Oil of bergamot and cinnamon freezes, (Marg.)
3	25	4	Human blood freezes.
2	28	2.5	Vinegar freezes.
1	30	1.25	Milk freezes.
0	32	0	Oxymuriatic acid melts, (Thomſon.) Water freezes.
2	36	2.5	Olive oil freezes.
4	40	5	Oxymuriatic acid boils, (Thomſon).—Equal parts of phoſphorus and ſulphur melt, (Pelletier).
5	43	6	Phoſphorus burns ſlowly.
6	45		Sulphuric acid, Sp. gr. 1.78, freezes, (Keir).
10	55	12	to 66 putrid fermentation, (Fourcroy).
12	59	15	Vinous fermentation begins, (Fourc.)

REAU.	FAHR.	CENT.	
14	64	17	Oil of aniſe freezes,
15	66	18	to 133, F. Animal putrefaction, 70 to panary fermentation.
16	68	20	Camphor evaporates, (Fourcroy).
19	75	24	Summer heat at Edinburgh.
20	77	25	Vinous fermentation rapid, (Fourcroy). Acetous ditto begins.
21	80	2.6	Phoſphorus burns in oxygen gas. 104 Goettling.
22	82	28	The adipocere of muſcle melts.
25	88	31	Acetous fermentation ceaſes, (Fourc.) Phoſphorus is ductile. F.
28	96	37	to 100, animal heat.
	97		Axunge melts, (Nicholſon).
29	98	36	Ether boils.
30	99	37	Phoſphorus melts, (Pelletier).
32	104	40	Reſin of bile melts.
33	107	41	Feveriſh heat.
34	109	42	Myrtle wax melts (Cadet).
36	112	45	Spermaceti melts (Boſtock).
40	122	50	Phoſphorus burns vividly, (Fourcroy). 148, (Thomſon).
42	127	53	Tallow melts, (Nicholſon.)
44	130	54	Ammonia is ſeparated from water.
48	140	60	Ammonia boils, (Dalton.)
49	142	61	Bees wax melts, (Irvine.)
50	145	63	Camphor ſublimes, (Venturi). Ambergris melts, (La Grange.)
55	155	79	Bleached wax melts, (Nicholſon).
59	165	74	Albumen coagulates. 156 (Black).
61	170	77	Sulphur evaporates, (Kirwan).
64	176	80	Alcohol boils. 174 (Black).
90	235	116	Adipocere of biliary calculi melts. (Fourcroy).
80	212	100	Water and volatile oils boil.
			Biſmuth 5 parts, tin 3, and lead, 2 melt.
83	219	104	Phoſphorus begins to diſtil, (Pelletier).
88	230	110	Muriate of lime boils, (Dalton).
89	234	111	Sulphur melts, Hope. (212°. Fourcroy). (185°. Kirwan).
93	242	116	Nitrous acid boils.
96	248	120	Nitric acid boils.

REAU.	FAHR.	CENT.	WED.	
112	283	140		White oxide of arſenic ſublimes. Alloy of equal parts of tin and biſmuth melts.
120	303	150		Sulphur burns ſlowly, and camphor melts, (Venturi).
134	334	168		Alloys, tin 3, and lead 2, and tin 2, biſmuth 1, melt.
182	442	227		Tin melts Crichton. (413, Irvine).
190	460	238		Tin 1, and lead 4, melt.
197	476	248		Biſmuth melts, (Irvine).
226	540	282		Arſenic ſublimes.
232	554	290		Phoſphorus boils, (Pelletier).
235	560	294		Oil of turpentine boils.
248	590	310		Sulphuric acid boils, (Dalton). 546, Black. 540, Bergm.
252	600	315		Linſeed oil boils. Sulphur ſublimes, (Davy). 570, Thomſon.
258	612	325		Lead melts, Crichton. (594, Irvine). 585, Secundat. (540, Newton).
269	635	335		Loweſt ignition of iron in the dark.
279	660	350		Mercury boils, (Dalton). 644, Secundat. 600, Black.
297	700	371		Zinc melts.
315	750	384		Iron bright red in the dark.
341	800	427		Hydrogen gas burns. 1000, Thomſon.
342	802	428		Charcoal burns, (Thomſon).
345	809	432		Antimony melts.
380	884	475		Iron red in the twilight.
448	1050	560		Iron red hot in a common fire.
462	1077	577	1	Red heat in day light.
564	1300	705	1.7 +	Azotic gas burns.
737	1807	986	6	Enamel colours burnt.
1451	2897	1814	14	Diamond burns. 1, Sir G. M‘Kenzie. 5000, Morveau.
1678	3807	2100	21	Braſs melts.
2024	4587	2530	27	Copper melts.
2082	4717	2602	28	Silver melts.
2130	4847	2700	29	Settling heat of plate glaſs.
2313	5237	2780	32	Gold melts.

REAU.	FAHR.	CENT.	WED.	
2880	6507	3580	40	Delft ware fired.
3750	8480	4680	57	Working heat of plate glaſs.
4450	10177	5610	70	Flint glaſs furnace.
5370	12257	6770	86	Cream coloured ſtone ware fired.
5800	13297	7330	94	Worceſter china vitrified.
6270	14337	7850	02	Stoneware fired.
6520	14727	8150	105	Chelſea china vitrified.
6925	15637	8650	112	Derby.
7025	15897	8770	114	Flint glaſs furnace greateſt heat.
7100	16007	8880	121	Bow china vitrified.
			123	Equal parts of chalk and clay melt.
7460	16807	9320	124	Plate glaſs furnace ſtrongeſt heat.
7650	17327	9600	125	Smith's forge.
7975	17977	9850	130	Cobalt melts. Caſt iron melts.
8250	18627	10320	135	Briſtol china no vitrification at
9131	20577	11414	150	Nickel melts. Heſſian crucible melted.
9325	21097	11680	154	Soft iron nails melted with the crucible.
9602	21637	12001	158	Iron melts.
9708	21877	12136	160	Manganeſe melts. Air furnace.
10286	23177	12857	170+	Platinum, tungſten, molybdenum, uranium, and titanium. melt.
11100	25127	13900	185	Greateſt heat obſerved.

N. B. As many of theſe higher numbers were calculated from Wedgewood's, by the ſliding rule, the two or three firſt figures only can be depended upon as correct. They will be found however to be ſufficiently accurate for moſt purpoſes.

TABLE OF FREEZING MIXTURES.

DURING the ſolution of many ſaline bodies, a very conſiderable reduction of temperature takes place. We ſhall extract from Mr Walker's paper a few of the moſt convenient mixtures employed for this purpoſe.

A mixture of]		[*reduces the temperature.*
Muriate of ammonia,	5 parts.	from 50° to 10°.
Nitrate of potaſs,	5	
Water,	16	
Sulphate of ſoda,	8	from 50° to 0°.
Muriatic acid,	5	
Snow,	1	from 32° to 0°.
Muriate of ſoda,	1	
Snow,	2	from 0° to—5°.
Muriate of ſoda,	1	
Snow,	1	from—5° to—18°.
Muriate of ſoda,	5	
Muriate of ammonia, and Nitrate of potaſs,	5	
Snow,	12	from—18° to—25°.
Muriate of ſoda,	5	
Nitrate of ammonia,	5	
Snow,	1	from 20° to—60°.
Diluted Sulphuric acid,	1	
Snow,	2	from 32° to—50°.
Muriate of lime,	3	
Snow,	1	from—40° to—73°.
Muriate of lime,	3	
Snow,	8	from—68° to—91°.
Diluted ſulphuric acid,	10	

The ſalts ought to be recently cryſtallized, and reduced to a very fine powder, and the mixture ſhould be made as quickly as poſſible. To produce a very great degree of cold, the materials muſt be previouſly cooled down by means of other mixtures.

TABLE of ſome GALVANIC CIRCLES, compoſed of two Perfect Conductors, and one Imperfect Conductor, (Davy).

More oxygenizable ſubſtances.	Leſs oxygenizable ſubſtances.	Oxygenizing fluids.
Zinc,	with gold, charcoal, ſilver, copper, tin, iron, mercury.	Solutions of nitric acid in water, of muriatic acid, ſulphuric acid, &c. Water, holding in ſolution oxygen, atmoſpheric air.
Iron,	—— gold, charcoal, ſilver, copper, tin.	
Tin,	—— gold, ſilver, charcoal.	
Lead,	—— gold, ſilver.	
Copper,	—— gold, ſilver.	Solution of nitrates of ſilver, and mercury. Nitric acid, acetous acid. Nitric acid.
Silver,	—— gold.	

TABLE of ſome GALVANIC CIRCLES, compoſed of two Imperfect Conductors, and one Perfect Conductor.

Perfect Conductors.	Imperfect Conductors.	Imperfect Conductors.
Charcoal, Copper, Silver, Lead, Tin, Iron, Zinc,	Solutions of hydroguretted alkaline ſulphurets, capable of acting on the firſt three metals, but not on the laſt three.	Solutions of nitrous acid, oxygenized muriatic acid, &c. capable of acting on all the metals.

WEIGHTS AND MEASURES.

" To employ, as the fundamental unity of all meaſures, a type " taken from nature itſelf, a type as unchangeable as the globe " on which we dwell,—to propoſe a metrical ſyſtem, of which all " the parts are intimately connected together, and of which the " multiples and ſubdiviſions follow a natural progreſſion, which " is ſimple, eaſy to comprehend :—this is moſt aſſuredly a beautiful, great, and ſublime idea, worthy of the enlightened age in " which we live."

Such were the ideas which influenced the French National Inſtitute, when they choſe as the baſe of the whole metrical ſyſtem, the fourth part of the terreſtrial meridian between the equator and the north pole. They adopted the ten millionth part of this arc for the unity of meaſure, which they denominated *metre*, and applied it equally to ſuperficial and ſolid meaſures; taking for the unity of the former the ſquare of the decuple, and for that of the latter the cube of the tenth part of the metre. They choſe for the unity of weight, the quantity of diſtilled water which the ſame cube contains when reduced to a conſtant ſtate preſented by nature itſelf; and, laſtly, they decided, that the multiples and ſub-multiples of each kind of meaſure, whether of weight, capacity, ſurface, or length, ſhould be always taken in the decimal progreſſion, as being the moſt ſimple, the moſt natural, and the moſt eaſy, for calculation, according to the ſyſtem of numeration which all Europe has employed for centuries.

By a careful meaſurement of the arc between Dunkirk and Mountjouy, they found the length of the metre to be equal to 443.296 lines of the toiſe of Peru. The cubic decimetre of diſtilled water, taken at its maximum of denſity and weight *in vacuo*, that is the unity of weight, was found to be 18827.15 grains of the pile of Charlemagne. By actual compariſon, the metre was found to be equal to 39.371 Engliſh inches at 62°, the temperature univerſally employed in the compariſon of Engliſh ſtandards : and upon theſe data the following tables have been conſtructed.

TABLES OF WEIGHTS AND MEASURES.

Troy Weight.

Pound.	Ounces.	Drachms.	Scruples.	Grains.	Grammes.
1	12	96	288	5760	372.96
	1	8	24	480	31.08
		1	3	60	3.885
			1	20	1.295
				1	0.06475

Avoirdupois Weight.

Pound.	Ounces.	Drachms.	Grains.	Grammes.
1	16	256	7000	453.25
	1	16	437.5	28.32
		1	27.975	1.81

MEASURES.

Gallon.	Pints.	Ounces.	Drachms.	Cub. Inch.	Litres.
1	8	128	1024	231	3.78515
	1	16	128	28.875	0.47398
		1	8	1.8047	0.02957
			1	0.2256	0.00396

1 Pint of water weighs lb 1 oz [illegible]

Meaſures of Length; the Metre being at 32°, and the foot at 62°.

		English inches.		Mil.	Fur.	Yds.	Feet.	Inch.
Millimetre	=	.03937						
Centimetre	=	.39371						
Decimetre	=	3.93710						
Metre	=	39.37100						
Decametre	=	393.71000	=	0	0	10	2	9.7
Hecatometre	=	3937.10000	=	0	0	109	1	1
Chiliometre	=	39371.00000	=	0	4	213	1	10.2
Myriometre	=	393710.00000	=	6	1	156	0	6

Meaſures of Capacity.

		Cubic inches.		*Engliſh.*			
				Tons.	Hogſ.	Wine Gall.	Pints.
Millilitre	=	.06103					
Centilitre	=	.61028					
Decilitre	=	6.10280					
Litre	=	61.02800	=	0	0	0.	2.1133
Decalitre	=	610.28000	=	0	0	2.	5.1352
Hecatolitre	=	6102.80000	=	0	0	26.419	
Chiliolitre	=	61028.00000	=	1	0	12.19	
Myriolitre	=	610280.00000	=	10	1	58.9	

Meaſures of Weight.

		English grains		*Avoirdupois.*		
				Poun.	Oun.	Dram.
Milligramme	=	.0154				
Centigramme	=	.1544				
Decigramme	=	1.5444				
Gramme	=	15.4440				
Decagramme	=	154.4402	=	0	0	5.65
Hecatogramme	=	1544.4023	=	0	3	8.5
Chiliegramme	=	15444.0234	=	2	3	5
Myriogramme	=	154440.2344	=	22	1	2

Table of Specific Gravities correſponding to the degrees of Baumé's hydrometers for ſpirits and ſalts at 55° Fahrenheit.

Baumé's Hydrometers at 55° Fahrenheit.

SPIRITS.		SP. GR.
40	=	817
35	=	842
30	=	867
25	=	897

SPIRITS. SP. GR.
20 = 928
15 = 963

OR SALTS.
10 = 1000 = 0
1040 = 6
0 = 1072 = 10
1089 = 12
1114 = 15
1170 = 21

1200 = 24
1261 = 30
1333 = 36
1373 = 39
1455 = 45
1547 = 51
1594 = 54
1717 = 60
1848 = 66
1920 = 69
2000 = 72

Comparative Weights of Gaſeous Fluids.

	100 CUBIC INCHES.		SPECIFIC GRAVITY.		
	French, in French grains.	Engliſh, in Troy grains.	*Standard.* Water.	Air.	
Water	37419.8		1000.	813.5	L.
Ditto		25242.2	1000.	814.3	S.
Atmoſpheric air	46.		1.2293	1.	L
Ditto		31.	1.2279	1.	S.K.
Oxygen	51.		1.365	1.11	L.
Ditto		34.	1.35	1.09	K.
Ditto		35.09	1.39	1.13	D.
Nitrogen	44.44		1.19	0.965	L.
Ditto		30.535	1.21	0.985	K.
Ditto		30.45	1.20	0.98	D.
Ammonia		18.16	0.715	0.585	K.
Ditto		18.	0.713	0.58	D.
Hydrogen	3.5		0.0935	0.076	F.
Ditto		2.613	0.1031	0.084	K.
Hydrocarbonous oxides		14.5	0.573	0.467	C.
		16.	0.632	0.516	C.
		20.	0.78	0.645	C.
		21.	0.83	0.677	C.
Carbonic oxide		30.	1.185	0.965	C.
Carbonic acid		46.5	1.84	1.5	K.
		45.5	1.802	1.47	D.
Nitrous oxide		50.1	1.985	1.615	D.
Nitric oxide		37.	1.465	1.193	K.
Ditto		34.3	1.36	1.105	D.
Nitric acid		76.	3.	2.425	D.
Sulphuretted hydrogen		34.286	1.36	1.205	K.
Sulphurous acid		70.215	2.75	2.24	K.
Muriatic acid	66.		1.765	1.43	B.

L. Lavoiſier. S. Shuckburgh. K. Kirwan. D. Davie. C. Cruikſhank. B. Briſſon.

SOLIDS.

Diamond	3.5212
Native ſulphur	2.0332
Melted do.	1.9907
Phoſphorus,	1.7140
Platinum rolled,	22.0690
Gold hammered,	19.3617
Tungſten,	17.6
Mercury,	13.5681
Sulphuret of do.	10.
Lead melted,	11.3523
Silver hammered,	10.5107
Biſmuth melted,	9.8227
Nickel do.	9.
Copper wire,	8.8785
Cobalt,	8.5384
Arſenic,	8.31
Arſenious acid,	3.706
Bar iron,	7.788
Caſt iron,	7.207
Steel hardened,	7.8404
Molybdenum,	7.5
Tin hardened,	7.3065
Zinc,	7.1908
Manganeſe,	7.
Antimony,	6.89
Sulphuret of do.	4.0643
Glaſs of do.	4.9464
Uranium,	6.44
Tellurium,	6.115
Collumbium,	5.918
*Soda,	1.336
*Strontia,	1.647
*Sulphate of ſoda,	1.4457
*——— magneſia,	1.6603
*Muriate of lime,	1.7603
*——— baryta,	2.8257
*——— mercury,	5.1398
*Sub-muriateofmercury,	7.1758
*Tartrate of potaſs,	1.5567
*——— ſoda,	1.7437
*Acetate of ſoda,	2.109
*——— lead,	2.345
*——— iron,	1.398
*Phoſphate of ſoda,	1.333
*Carbonate of ſoda,	1.7377
*——— magneſia,	0.294
Ambergris,	0.9263
Tallow,	0.9419
Hogs lard,	0.9478
Yellow wax,	0.9648
White do.	0.9686
Spermaceti,	0.9433
Roſin,	1.0727
Sandarac,	1.0920
Maſtich,	1.0742
Copal,	1.0452
Amber,	1.0780
Elemi,	1.0682
Labdanum,	1.1862
Reſin of Guaiac,	1.2289
Reſin of jalap,	1.2185
Dragons' blood,	1.2045
Tacamahaca,	1.0463
Benzoin,	1.0924
Storax,	1.1098
Gum ammoniac,	1.2071
Gamboge,	1.2216
Olibanum,	1.1732
Myrrh,	1.3600
Scammony,	1.2354
Galbanum,	1.2120
Sagapenum,	1.2008
Opoponax,	1.6226
Aſſafœtida,	1.3275
Hepatic aloes,	1.3586
Socotorine aloes,	1.3795
Opium,	1.3366
Gum arabic,	1.4523
—— tragacanth,	1.3161
Extract of liquorice,	1.7228
——— catechu,	1.4573
Sarcocoll,	1.2684
Camphor,	0.9887
Caoutchouc,	0.9335
Indigo,	0.7690
Arnotto,	.5956
Cork,	0.2400

FLUIDS.

Water,	1.0000	Sulphuric ether,	0.7394
Sulphuric acid,	2.1250	Nitrous ether,	0.9088
Nitric acid,	1.5800	Oil of turpentine,	0.8697
Muriatic acid,	1.1940	Volatile oil of lavender,	0.8938
Acetic do.	1.0135	——— cloves,	1.0363
Strong acetic do.	1.0626	——— cinnamon,	1.0439
Carbonic acid,	1.0015	Oil of olives,	0.9153
Water ſaturated with		——— almonds,	0.9170
ammonia,	0.8970	Linſeed oil,	0.9403
Alcohol,	0.8293	Whale oil,	0.9233

SALTS.

	H.	K.	M.	N.
Potaſs,	1.7085	4.6215		
Lime,	1.5233	2.3908	2.3700	
Magneſia,	0.3460	2.3298		
Alumina,	0.8200	2.0000		
Baryta,	2.3740	4.0000		
Sulphate of potaſs,	2.4073	2.636	2.398	
——— alumina,	1.7109		1.7260	1.714
——— zinc,	1.9120		1.9	1.712
——— iron,	1.8399		1.88	
——— copper,	2.1943	2.23		
Nitrate of potaſs,	1.9369	1.933	1.901	1.900
Muriate of ſoda,	2.2001		2.0835	2.143
Acetate of lead,	2.3450		2.3953	
Super tartrate of potaſs,	1.9153		1.8745	
Sub-borate of ſoda,	1.7230		1.7170	1.714
Carbonate of potaſs,	2.0120		2.749	
——— ſoda,	1.3591	1.421		
——— ammonia,	0.9660	1.8245	1.5026	

H. Haſſenfratz, K. Kirwan, M. Muſchenbroek, N. Newton. The very great diſſimilarity of theſe eſtimations, ſhew how difficult it is to aſcertain the ſpecific gravity of ſoluble ſubſtances. Haſſenfratz is the laſt who has paid particular attention to this ſubject; and as he is followed in the beſt ſyſtems of chemiſtry, we have inſerted in the general table the ſalts marked with an aſteriſk examined by him only, although we muſt confeſs, that we have no confidence in his reſults, as they are frequently contradicted by obvious facts. For example, according to him magneſia is not half the weight of ſulphuric ether, and yet it is certain, that it ſinks in water.

TABLE *of the* SOLUBILITY *of Saline and other Subſtances, in* 100 *parts of Water, at the Temperature of* 60° *and* 212°

Acids.		
Sulphuric,	unlimited.	unlimited.
Nitric,	do.	do.
Acetic,	do.	do.
Pruſſic,	do.	do.
Phoſphoric, Acetic, Tartaric, Malic, Lactic, Laccic,	very ſoluble, proportion not determined.	
Arſenic,	150	
Arſenious acid,	1.25	6.6
Citric,	133	200
Oxalic,	50	100
Gallic,	8.3	66
Boracic,		2
Mucic,	0.84	1.25
Succinic,	4 1.04	50
Suberic,	0.69	50
Camphoric,	1.04	8.3
Benzoic,	0.208	4.17
Molybdic,		0.1
Chromic, unknown.		
Tungſtic, inſoluble.		
Salifiable Baſes.		
Potaſs,	50	
Soda, very ſoluble, proportion not known.		
Baryta,	5	50
——— cryſtallized,	57	any quantity.
Strontia,	0.6	
——— cryſtallized,	1.9	50
Lime,	0.2	
Salts.		
Sulphate of potaſs,	6.25	20
Super-ſulphate of potaſs,	50	100+
Sulphate of ſoda,	37.4	125
——— ammonia,	50	100

Temperatures,	60°	212°
Sulphate of magneſia,	100	133
——— alumina, very ſoluble, proportion unknown.		
Super-ſulphate of alumina and potaſs, ——— ammonia,	alum, 5	133
Nitrate of baryta,	8	25
——— potaſs,	14.25	100
——— ſoda,	33	100 +
——— ſtrontia,	100	200
——— lime,	400	any quantity.
——— ammonia,	50	200
——— magneſia,	100	100 +
Muriate of baryta,	20	
——— potaſs,	33	
——— ſoda,	35.42	36.16
——— ſtrontia,	150	any quantity.
——— lime,	200	
——— ammonia,	33	100
——— magneſia,	100	
Oxy-muriate of potaſs,	6	40
Phoſphate of potaſs very ſoluble.		
——— ſoda,	25	50
——— ammonia,	25	25 +
——— magneſia,	6.6	
Sub-borate of ſoda,	8.4	16.8
Carbonate of potaſs,	25	83.3
——— ſoda,	50	100 +
——— magneſia,	2	
——— ammonia,	50 +	100
Acetate of potaſs,	100	
——— ſoda,	35	
——— ammonia very ſoluble.		
——— magneſia, do.		
——— ſtrontia,		40.8
Super-tartrate of potaſs,	1.67	3.3
Tartrate of potaſs,	25	
——— potaſs and ſoda,	25	
Super-oxalate of potaſs,		10
Citrate of potaſs very ſoluble.		
Pruſſiate of potaſs and iron.		
Nitrate of ſilver very ſoluble.		
Muriate of mercury (corroſive ſublimate)	5	50
Sulphate of copper,	25	50
Acetate of copper very ſoluble.		
Sulphate of iron,	50	133
Muriate of iron very ſoluble.		

Temperatures,	60°	212°
Tartrate of iron and potaſs.		
Acetates of lead, and of mercury,		
Sulphate of zinc, - -	44	44+
Acetate of zinc very ſoluble.		
Tartrate of antimony and potaſs, -	1.25	2.5
——— by my experiments, -	6.6	33
Alkaline ſoaps very ſoluble.		
Sugar, - -	100	any quantity.
Gum very ſoluble.		
Starch, - -	0	very ſoluble.
Jelly, - -	ſparingly,	abundantly.
Gelatin, -	ſoluble,	more ſo.
Urea very ſoluble.		
Cinchonin.		

Salts not ſoluble in 100 *times their weight of water*

Sulphates of baryta, ſtrontia, and lime, and ſub-ſulphate of mercury.
Phoſphates of baryta, ſtrontia, lime, magneſia, and mercury.
Fluate of lime.
Carbonates of baryta, ſtrontia, and lime.
Muriates of lead, and ſilver, and ſub-muriate of mercury, (Calomel.)
Sub-acetate of copper.

SOLUBILITY *of Saline and other Subſtances in* 100 *parts of Alcohol, at the Temperature of* - - 176°

All the Acids, except the ſulphuric, nitric, and oxy-muriatic, which decompoſe it and the phoſphoric and metallic acids.	
Potaſs, ſoda, and ammonia, very ſoluble.	
Red ſulphate of iron,	
Muriate of iron, - -	100
——— lime, - -	100
Nitrate of ammonia, - -	89.2
Muriate of mercury, - -	88.3
Camphor, - -	75
Nitrate of ſilver, - -	41.7
Refined Sugar, - -	24.6
Muriate of ammonia, - -	7.1
Arſeniate of potaſs, -	3.75
Nitrate of potaſs, - -	2.9
Arſeniate of ſoda, -	1.7

Muriate of ſoda (Mr. Chenevix). Alkaline ſoaps. Magneſian do. Extractive. Tannin. Volatile oils. Adipocere. Reſins. Urea. Cinchonin.

Subſtances inſoluble in Alcohol.

Earths.
Phoſphoric and Metallic acids.
Almoſt all the ſulphates and carbonates.
The nitrates of lead and mercury.
The muriates of lead, ſilver, and ſoda.
The ſub-borate of ſoda.
The tartrate of ſoda and potaſs, and the ſuper-tartrate of potaſs.
Fixed oils, wax, and ſtarch.
Gum, caoutchouc, ſuber, lignin, gelatin, albumen, and fibrin.

TABLE *of the Weight of the different* GASES *abſorbed by* 100 *parts of Water at* 60° *F.*

Carbonic acid,	108.
Muriatic acid,	100.
Sulphuretted hydrogen	86.
Nitrous oxide,	54·
Ammonia,	34·
Sulphurous acid, Fourc. 33·3, Thom. 9·75, Dr. Prieſtly.	3·96
Nitric oxide,	5·
Oxygen,	3·7
Phoſphuretted hydrogen	2.14
Carbonic oxide,	2.01
Hydrogen,	1.61
Carburetted hydrogen,	1.40
Nitrogen,	1.53
Oxy-muriatic acid,	0.43

EXPLANATION OF THE PLATES.

Fig. 1. 2. 3. Mortars of metal, marble, and earthen ware, with their reſpective peſtles, (336.)

Fig. 4. A levigating ſtone and muller.

a. The table of poliſhed porphyry or other ſiliceous ſtone.

b. The muller of the ſame ſubſtance.

Fig. 5. A compound ſieve.

a. The lid.

c. The body containing the ſieve.

b. The receiver.

Fig. 6. A funnel

Fig. 7. A hooked glaſs rod. Several of which may be hung round the edge of the funnel, to prevent the filtering ſubſtances from adhering too cloſely to its ſides.

Fig. 8. A compound ſyphon.

a. b. c. The ſyphon.

f. g. The mouth piece.

d. e. A board for ſupporting it.

When we inſert the upper orifice *a.* into any liquid, and cloſe the lower orifice *c.* with the finger, by ſucking through *f.* the fluid will riſe from *a.* to *b.* and proceed to *g.* towards *f.* As ſoon as it has paſſed *g.* the finger is to be removed, and the fluid will immediately flow through *c.* and continue flowing as long as any remains above the orifice *a.* It is abſolutely neceſſary that the point *g.* where the mouth-piece joins the ſyphon, be lower than *a.*

Fig. 9. A board perforated with holes for ſupporting funnels.

Fig. 10. A ſeparatory. The fluids to be ſeparated are introduced through the orifice A, which is then cloſed with a ſtopper. The one neck is then to be ſhut with the finger, and the phial is to be inclined to the other ſide. As ſoon as the fluids have ſeparated by means of their ſpecific gravity, the finger is to be removed, and the whole of the heavier fluid will run through the lower neck, before any of the lighter eſcapes.

Fig. 11. and 12. Glaſs graduated meaſures. 11. A cylindrical one for large, 12. A conical one for ſmall, quantities.

Fig. 13. A phial of a particular ſhape for keeping laudanum.

Fig. 14. External view of Dr. Black's furnace.

a. The body.

b. The aſh-pit.

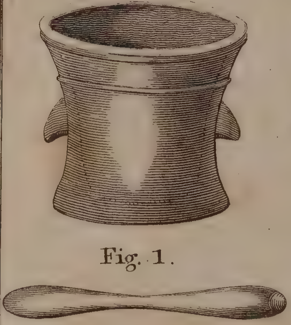
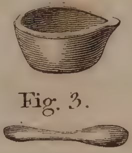


Fig. 1.



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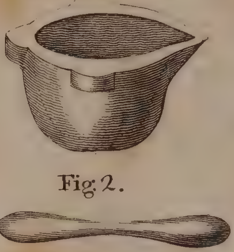
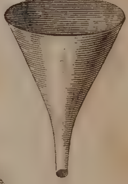


Fig. 2.

Fig. 6.



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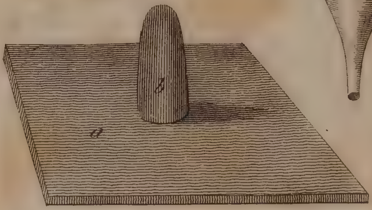


Fig. 5.

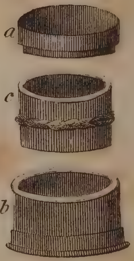
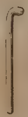


Fig. 7.



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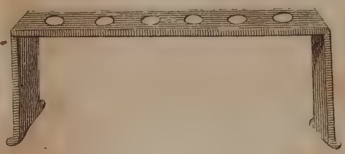

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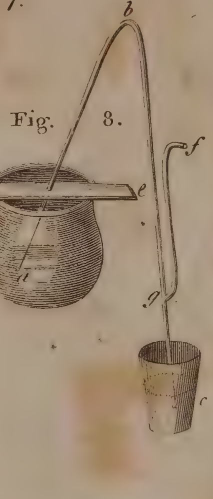
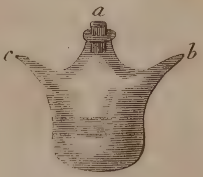


Fig. 10.



Lizar Sculpt

Fig. 11.

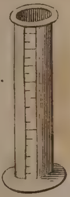


Fig. 12.

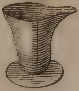


Fig. 13.

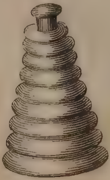


Fig. 14.

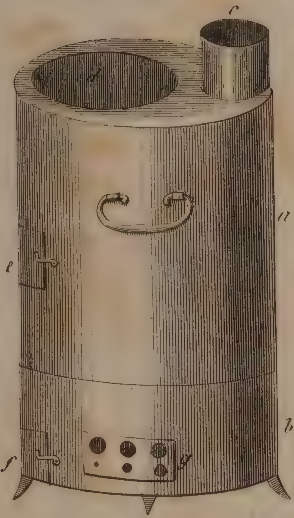


Fig. 15.

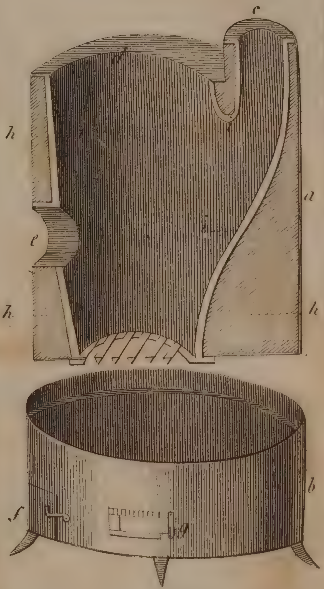


Fig. 16.

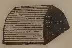
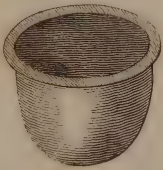


Fig. 17.



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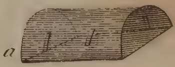


Fig. 19.

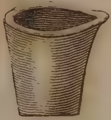


Fig. 20.

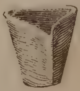
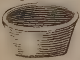


Fig. 21.



[illegible]

c. The chimney.

d. The circular hole for receiving the ſand-pot.

e. A door about the centre of the body, to be opened when the furnace is uſed as a reverberatory. In Dr. Black's furnace, there is properly no aperture in the ſide, and indeed as its peculiar excellence conſiſts in the power which it gives the operator of regulating the quantity of air admitted to the fuel, and by that means of regulating the intenſity of the fire; every aperture is rather to be conſidered as an injury than as an improvement; and at all times when they are not employed, they muſt be accurately cloſed and luted up.

f. The door of the aſh-pit.

g. The damping plate for regulating the admiſſion of air, having ſix holes, fitted with ſtoppers, increaſing in ſize in a geometrical ratio.

Fig. 15. A vertical ſection of the body of the ſame furnace, to ſhew the manner of luting, and the form and poſition of the grate.

a.——*g.* As in the former figure, except the damping plate, which is here cloſed by a ſliding door with a graduated ſcale.

h. The form which is given to the lute of clay and charcoal which is applied next to the iron.

i. The form given to the lute of ſand and clay, with which the former is lined.

e. Is a ſemicircular aperture left unluted, to ſerve as a door when neceſſary. On other occaſions it is filled up with a ſemi-cylindrical piece of fire-brick, Fig. 16. accurately luted in.

k. The grate faſtened on the outſide of the body.

Fig. 16. A ſemi-cylindrical piece of fire-brick, for cloſing the door *e.* of the furnace.

Fig. 17. The ſand-pot, which is ſuſpended in the aperture *d.* of the furnace, by means of the projecting ring *a. b.*

Fig. 18. A muffle, *a. a.* apertures in its ſides for the admiſſion of the heated air.

Fig. 19. A large black-lead crucible.

Fig. 20. A ſmall Heſſian crucible.

Fig. 21. 22. Teſts.

Fig. 23. A ſmall ſupport of clay, to raiſe the crucible above the grate.

Fig. 24. A pair of crucible tongs.

Fig. 25. A ſupport for raiſing the muffle as high as the door *e.* of the furnace.

Fig. 26. A ring for ſuſpending a retort within the furnace, when

we wiſh to expoſe it to the immediate action of the fire. The ring itſelf *a. b.* is ſuſpended within the aperture *d.* of the furnace, by means of the three-hooked branches *c. c. c.*

Fig. 27. Semicircular rings of plate-iron, for applying round the neck of a retort when ſuſpended within the furnace, in order to cloſe as much as poſſible the aperture *d.* Fig. 1. The largeſt pair *a.* are firſt made to reſt upon the edge of the aperture *d*, the next pair *b.* upon them, and ſo until they come in contact with the neck of the retort. The whole are then to be covered with aſhes or ſand, to prevent the loſs of heat, and the eſcape of vapours, from the burning fuel.

Fig. 28. Circular rings *a. b.* to be applied in the ſame manner when we wiſh to evaporate with the naked fire. We muſt always take care that the fluid riſes higher than the portion of the evaporating veſſel introduced within the aperture of the ring; *c.* a circular piece of iron, which when applied with the rings *a. b.* completely cloſſes the aperture *d.* of the furnace.

Fig. 29. 30. 31, 32. Evaporating veſſels of different ſhapes.

Fig. 33. A long-necked matraſs.

Fig. 34. A jar.

Fig. 35. A phial or receiver.

Fig. 36. A cucurbit.

Fig. 37. A cucurbit with its capital.

Fig. 38. The arrangement of the apparatus for diſtilling *per deſcenſum.* The ſubſtance to be diſtilled is laid on the metallic plate *a.* which is perforated with holes. The burning fuel is laid upon the upper plate *b.* alſo of metal, but not perforated. On the application of heat the vapour deſcends into the cavity *a. c.* where it is condenſed.

Fig. 39. A retort and receiver; *a.* the tetort; *b.* the receiver.

Fig. 40. A retort funnel.

Fig. 41. A metallic ſtill.

c. d. e. f. The body.

a. b. e. f. The lower portion of the body, which hangs within the aperture *d.* of the furnace, by the projecting part *a. b.*

d. g. c. The head of the ſtill.

d. c. A gutter which goes round the bottom of the head, for conveying any vapours which may be condenſed there, into the ſpout *h*, which conveys away the vapour and the fluid condenſed in the head into the refrigeratory.

Fig. 42. A refrigeratory.

a. b. c. d. A cylindrical veſſel filled with cold water.

e. f. A ſpiral metallic pipe which paſſes through it. The ſpout *h.* of the ſtill is inſerted within the upper orifice *e.*;

Fig: 22.

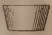


Fig 23

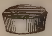
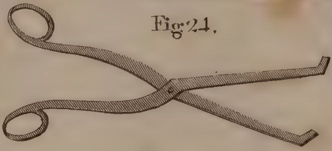


Fig 24.



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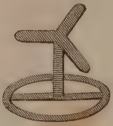


Fig:26.

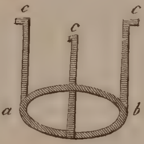


Fig 27.

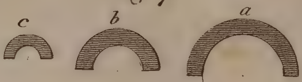


Fig 28.

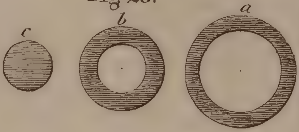


Fig 29.

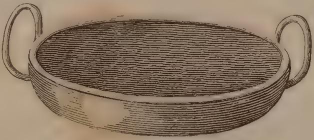


Fig 30.

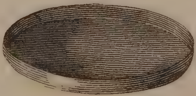
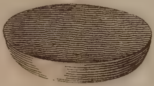


Fig.31.



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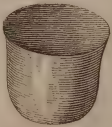

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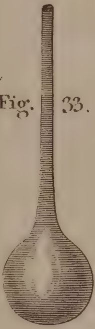

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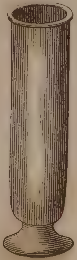

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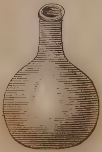

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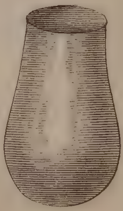

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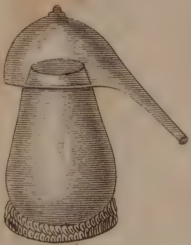
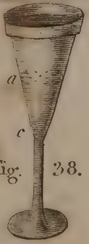


D Lizars ſculpt

PLATE IV.



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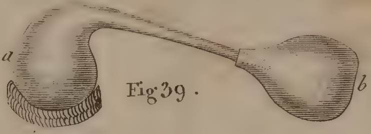


Fig 39.

Fig 41.

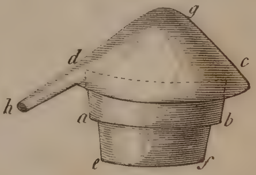
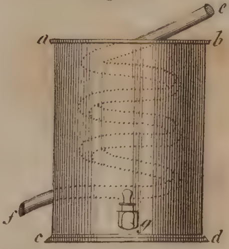


Fig 40.

Fig 42.



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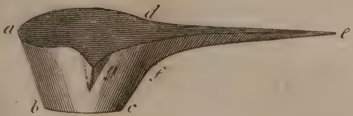

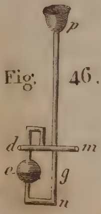

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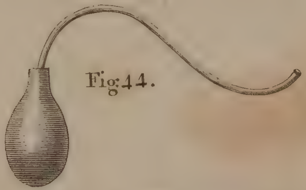


Fig 44.

Fig 50.

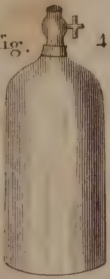
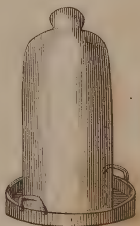


Fig. 49.



D Lazars sculp

therefore the vapours which eſcape from the head of the ſtill enter it, and are condenſed in their paſſage towards *f.* the lower termination of the pipe from which the diſtilled fluid runs, and is received into proper veſſels. As the water in the veſſel *a. b. c. d.* continually abſtracts caloric from the vapours, it is apt to become too warm to condenſe them. As ſoon, therefore, as any ſteam eſcapes by the ſpout *f.* the water muſt be drawn off by the cock *g.* and its place ſupplied by cold water.

Fig. 43. A veſſel for boiling inflammable fluids.

a. b. c. d. The body of the kettle.

d. e. f. A long ſpout proceeding from it, for preventing any riſk of boiling over.

g. A ſhort ſpout for pouring out. The veſſel ſhould not be filled above *h. f.* and the long ſpout *d. e. f.* ſhould be placed ſo as to be as little heated as poſſible. When the fluid begins to ſwell and boil up, both from the great increaſe of ſurface, and from part of it running up the cooler ſpout *d. e. f.* the ebullition will be checked, and all danger of running over be prevented.

Fig. 44. A body with a bent tube.

a. b. The body.

b. c. A ſigmoid tube accurately ground to it. When any permanently elaſtic fluid is generated within the body *a. b.* it eſcapes by the extremity of the tube, and may be collected by introducing it under a jar filled with water or mercury in the pneumatic ciſtern. This ſimple apparatus can only be uſed conveniently when the production of the gas is not rapid, or requires the application of heat.

Fig. 45. A Woulfe's apparatus.

a. b. c. c. d. e. A tubulated retort and receiver.

f. f.' f." Three three-necked bottles. The firſt *f.* is commonly filled with water, and the two others with alkaline ſolutions.

d. g. d.' g.' d." g." d.''' g.''' Bent tubes connecting the different parts of the apparatus, ſo that when any vapour eſcapes from the receiver *c. d. e.* it paſſes along the tube *d. g.* and riſes through the fluid contained in the bottle *f.* where it remains in contact with the ſurface, and under conſiderable preſſure, until the expanſion of the vapour, not condenſible in *f.* overcomes the column of fluid *h. g.'* in the bottle *f.'* and eſcapes into the upper part of *f.'* In the ſame manner the uncondenſed vapours proceed to *f."* and at laſt to the pneumatic apparatus.

But, as in proceſſes of this kind, diminution of temperature and other cauſes, frequently produce ſudden condenſations of the gaſes, contained in the different parts of the apparatus, eſpecially in the retort and receiver, any ſuch occurrence would cauſe the fluids to move through the connecting tubes in a retrograde direction. This accident is prevented, by inſerting through the third neck of each bottle a ſmall tube *k. l.* having its lower extremity *l*, immerſed in the fluid contained in the bottle. By this contrivance no fluid can poſſibly paſs from one bottle into another, becauſe the columns *g. m.* &c. which reſiſt the abſorption, are much higher than the colums *h. l.* which oppoſe the admiſſion of external air. While, on the contrary, no gas can eſcape through theſe tubes, becauſe the columns *h. k.* which oppoſe their eſcape, are higher than the columns *g. h.* which reſiſt its progreſs to the next bottle. From their uſe theſe tubes have got the name of Tubes of Safety.

Another contrivance for the ſame purpoſe, the invention of C. Welter, ſeems now to be much uſed in France. It is fixed to the connecting tubes as at *n.*

Fig. 46. To explain it more fully, we have given a ſeparate view, taken in an oblique direction. When the apparatus is adjuſted, a ſmall quantity of water is poured through the funnel *p.* until it riſes to about the centre of the ball *o.* Now, on any abſorption taking place, the fluid riſes in the ball *o*, until the column *g. n.* be annihilated, when a quantity of air will immediately ruſh in through *p. g. n, o.* &c., and the water will regain its former equilibrium. On the other hand, no gas can eſcape by this tube, becauſe the whole fluid contained in the ball and tube muſt previouſly enter the portion of the tube *n. p.* where it would form a column of ſuch a height that its preſſure could not be overcome.

Fig. 47. A vertical ſection of a pneumatic ciſtern.

a. b. c. d. The whole cavity of the ciſtern.
e. f. A ſhelf for holding the jars.
e. b. c. The well for filling the jars.
g. h. The ſurface of the fluid contained in the ciſtern, which muſt always be higher than the ſurface of the ſhelf.

Fig. 48. 49. 50. 51. Pneumatic jars of different ſhapes.

Fig. 48. A jar in the ſituation in which it is filled with gas.

Fig. 49. A jar fitted with a ſtop cock.

Fig. 50. A jar placed upon a tray for removing it from the pneumatic ciſtern.

Fig. 51. A graduated jar, commonly called a Eudiometer.

Fig. 52. A hydroſtatic funnel, for pouring fluids gradually into air-tight veſſels, eſpecially when attended with the formation of gas. It is evident, that any portion of fluid, poured into the fun-

PLATE V.

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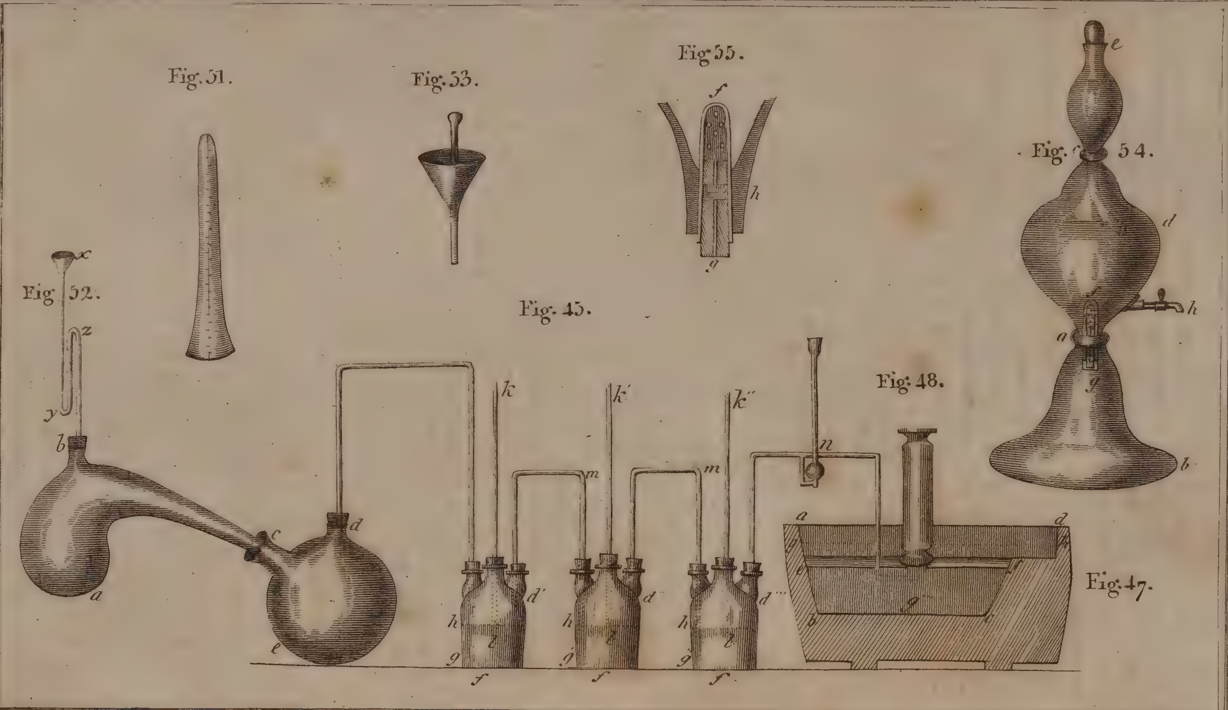


D. Lizars Sculp'

nel *x.* more than ſufficient to fill the two firſt parts of the bent tube up to the level *z.* will eſcape by the lower extremity *b.* At the ſame time, no gas can return through this funnel, unleſs its preſſure be able to overcome the reſiſtance of a column of fluid of the height of *x. y.*

Fig. 53. Another contrivance for the ſame purpoſe. It conſiſts of a common funnel; in the throat of which is inſerted a rod with a conical point, which regulates the paſſage of the fluid through the funnel, according to the firmneſs with which it is ſcrewed in.

Fig. 54. Nooth's apparatus for promoting the abſorption of gaſeous fluids by liquids. It conſiſts of three principal pieces; a lower piece *a. b.* a middle piece *a. c.* and an upper piece *d. e.*; all of which are accurately ground to each other. The ſubſtances from which the gas is to be extricated are put into the lower piece. The middle piece is filled with the fluid with which the gas is to be combined, and the upper piece is left empty. As ſoon as a ſufficient quantity of gas is formed to overcome the preſſure, it paſſes through the valve *f. g.* and riſes through the fluid to the upper part of the middle piece. At the ſame time it forces a quantity of fluid into the upper piece through its lower aperture *d.* As ſoon as ſo much of the fluid has been forced from the middle piece, as to bring its ſurface down to the level of the lower aperture of the upper piece, a portion of gas eſcapes into the upper piece, and the fluid riſes a little in the middle piece. The upper piece is cloſed with a conical ſtopper *e.* which yields, and permits the eſcape of a portion of gas, as ſoon as its preſſure in the upper piece becomes coſinderable. *h.* Is a glaſs cock for drawing off the fluid.

Fig. 55. The valve of Nooth's apparatus. It conſiſts of an internal tube *g.* of ſmall caliber, but pretty ſtout in ſubſtance, and ground into an external tube *f*, cloſed at the upper end, but perforated with ſmall holes, to allow the gas to paſs. After the internal tube is fitted to the external, a portion of it is cut out as at *h.* ſufficient to receive a ſmall hemiſphere of glaſs, and to allow the hemiſphere to riſe a little in its chamber, but not to turn over in it. The upper piece of the internal tube is then thruſt home into the place where it is to remain, and the glaſs hemiſphere introduced with its plane recumbent on the upper end of the lower piece of the tube, which is ground perfectly flat, as is alſo the plane of the hemiſphere. From this conſtruction it is evident, that by the upward preſſure of any gas, the glaſs hemiſphere may be raiſed ſo as to allow it to paſs, while nothing can paſs downwards; for the ſtronger the preſſure from above, the cloſer does the valve become. We have been more particular in our deſcription of this valve, becauſe it has been very ingeniouſly applied to diſtilling apparatuſes by Mr. Pepys *junior* and Mr. Burkit.

CHEMICAL SIGNS.

It is unneceſſary here to point out the advantages which might reſult from a well-contrived ſyſtem of chemical ſigns. About the ſame time that the French chemiſts introduced their methodical nomenclature, they alſo propoſed a correſponding ſyſtem of chemical ſigns, which they intended ſhould ſpeak a language to be underſtood by the learned of all nations. In our explanation of their ſyſtem, we ſhall nearly follow what Mr. Chenevix has ſaid in his judicious remarks upon chemical nomenclature.

There are ſix ſimple radical ſigns, which may be conſidered as ſo many genera.

The firſt genus is the zig-zag line, and is uſed to denote light. See Plate, No. 1.

The ſecond genus is the ſtraight line. It comprehends three ſpecies, characterized by its direction.

Sp. 1. A perpendicular line denotes caloric, 3.

Sp. 2. A horizontal line denotes oxygen, 2.

Sp. 3. An oblique line from right to left, nitrogen 4.

The third genus is a creſcent, which is the generic ſign of ſimple combuſtibles.

Sp. 1. With the horns inclined to the right, carbon, 5.

Sp. 2. The reverſe of the former, hydrogen, 6.

Sp. 3. With the points upwards, ſulphur, 7.

Sp. 4. The reverſe of the latter, phoſphorus, 8.

The fourth genus is a triangle. It comprehends the ſimple ſalifiable baſes.

Sp. 1. With the point upwards, and the baſe horizontal, 9. the alkalies.

Sp. 2. With the point downwards, 10. the earths.

Each of the ſpecies of this genus comprehends ſeveral individuals, which are diſtinguiſhed by inſerting within the triangle the firſt letter of its name in the Latin language, or, if two ſpecies begin with the ſame letter, the firſt letter of the ſecond ſyllable is added; thus, for potaſs P. ſoda S. baryta B. ſtrontia St. lime C. magneſia M. glucina Gc. gadolina Gd. or Y. for yttria, alumina Al. zirconia Z. ſilica Sl.

The fifth genus is a circle, 11. It comprehends the metals; and the ſpecies are diſtinguiſhed in the ſame manner as the former, by inſerting within it the primary letters of the firſt and ſecond ſyllables; thus, for gold Ar. platinum Pt. ſilver Ag. mercury H. copper Cp. iron Fr. lead Pb. tin Sn. zinc Z. antimony Sb. or At. biſmuth B. cobalt Cb. nickel Nk. manganeſe Mg. uranium U. titanium Tt. tellurium Tl. chromium Cm. arſenic Aſ. molybdenum Ml. tungſten Ts. columbium Cl.

The ſixth genus is a ſquare: it comprehends all the unknown baſes of the acids, and the baſes of the compound oxids and acids.

Sp. 1. A ſquare with perpendicular ſides, 12. It contains the unknown and compound acidifiable baſes.

Sp. 2. A ſquare with inclined ſides, 13. It contains the compound oxides. The individuals of both ſpecies are diſtinguiſhed as before.

All compound bodies are expreſſed by combinations of theſe ſimple characters. But as ſimple bodies are capable of uniting in various proportions, it becomes neceſſary that theſe proportions ſhould be expreſſed; and relative poſition has appeared the moſt natural method of doing ſo. In general, when the proportion of any body in a compound is ſmall, its ſign is placed above, when large, below, as in 35. 36. 42. &c.

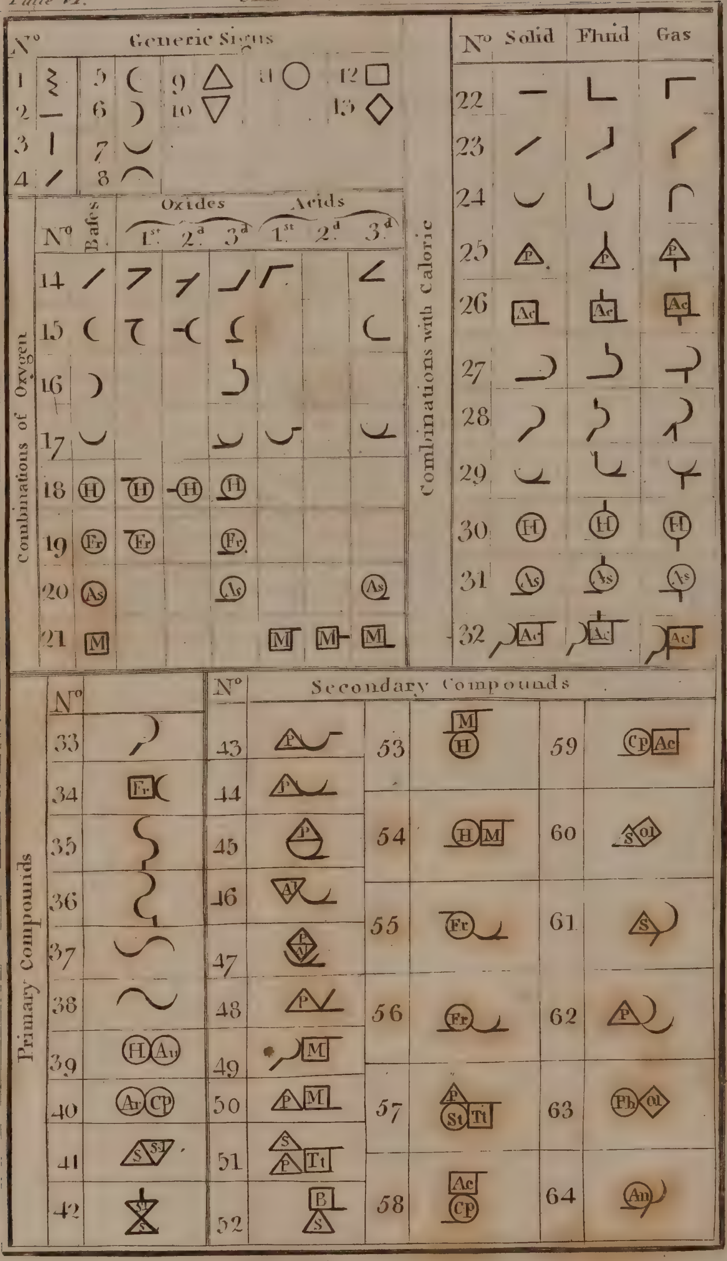
Caloric exiſts in all bodies: But according to its relative quantity, they exiſt as ſolids, fluids, or gaſes. To expreſs the firſt ſtate, it has not been thought neceſſary to introduce the ſign of caloric; to expreſs the ſecond, it is placed above; and to expreſs the third, below, as in the examples in the plate (22—32).

Oxygen alſo combines with many bodies, and in ſeveral proportions. The products reſulting from theſe combinations are either oxids or acides. The oxides may be characterized by affixing the ſign of oxygen to the left ſide of the ſign of the baſe, and the acids by affixing it to the right; and the greater or leſs degree of each may be marked by placing it above or below, as in the examples in the plate. In this I have deviated from all the tables of chemical ſigns which I have ſeen, and I truſt with propriety; for M. Chenevix has remarked of the ſyſtem, that "one of its chief "defects is the impoſſibility of marking, by any principles it points "out, the difference of the metallic oxides. A circle, with the "mark of oxygen at the top, is the only method of marking a metallic oxide; for if we put the mark of oxygen lower, it will then "have the force of an acid, and we muſt not confound the ſitua"tion of the ſigns to mark differences of ſtates, or the whole ſyſtem "will become confuſed." But the alteration propoſed enables us to mark no leſs than ſix ſtates of oxygenizement. When the ſign of oxygen is placed on the left, it implies that the compound is an oxide; if it be placed at top, it expreſſes the ſmalleſt degree of oxidizement; at bottom, the higheſt, and we have room for an intermediate one. The degrees of acidification are expreſſed in the ſame manner, except that the character of oxygen is placed to the right of the baſe. See 14—21. I have ſince found that the ſame propoſal has been made by Dr. Vandier in the Journ. de Phyſique, Vol. 56. and this coincidence is a proof that it is not arbitrary, but ariſes naturally from an attentive conſideration of the ſubject.

The other primary combinations are expreſſed in the ſame way. When they unite only in one proportion, or when the proportions are indifferent, the ſigns are placed indifferently, though it would be better to place them in one determinate way; but when either of them is in exceſs, its ſign is always placed below. Thus heavy hydro-carbonous oxide is expreſſed by placing the ſign of hydrogen above that of carbon, 36, light hydro-carbonous oxide by reverſing their poſition, 35. Glaſs is expreſſed by placing the ſigns of ſoda and ſilica ſide by ſide, 41; the liquor ſilicum, by placing the ſign of the alkali under that of the earth, and adding the ſign of fluidity above, 42.

The ſecondary compounds are expreſſed in a ſimilar manner. The baſis has been generally placed before the acid, to admit of the ſign of the degree of acidification being added to the acid; and the ſame poſition fortunately admits of the ſign of the degree of oxidizement being added to the oxide, when a metallic oxide forms the baſis of the ſalt. The exceſs of acid or baſe is marked as before, by placing the acid or baſe below. With regard to the metallic ſalts, Mr. Chenevix has given ſome reaſons for not introducing the ſign of oxygen; but he himſelf has given the moſt powerful reaſon for introducing it, by proving, that the real difference between calomel and corroſive ſublimate is in the ſtate of oxidizement of the metal. The manner of marking the oxides propoſed above, enables us to expreſs this difference diſtinctly, when the degree of oxidizement is aſcertained.

Plate VI. CHEMICAL SIGNS. *Page 127.*



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EXPLANATION *of the* TABLE *of* CHEMICAL SIGNS.

Generic Signs.

No.				
1. Light.	5. Carbon.	9. Alkalies.	11. Metals.	12. Acidifiable baſes, unknown or compound.
2. Oxygen.	6. Hydrogen.	10. Earths.		
3. Caloric.	7. Sulphur.			13. Compound oxides.
4. Nitrogen.	8. Phoſphorus.			

Combinations of Oxygen.

No.		Oxides.			Acids.		
		1	2	3	1	2	3
14.	Nitrogen.	Atmoſpheric air.	Nitrous oxide.	Nitric oxide.	Nitrous.		Nitric.
15.	Carbon.	Incombuſtible coal.	Charcoal.	Carbonic oxide.			Carbonic.
16.	Hydrogen.			Water.			
17.	Sulphur.			Oxide of ſulphur.	Sulphurous.		Sulphuric.
18.	Mercury.	Black oxide.	Yellow	Red.			
19.	Iron.	Green oxide.		Red.			
20.	Arſenic.			White.			Arſenic.
21	Muriatic radical.				Muriatic.	Oxygenized muriatic	Hyper-oxygenized muriatic.

Combinations of Caloric.

22. Oxygen. 23. Nitrogen. 24. Sulphur. 25. Potaſs. 26. Acetic acid. 27. Ice. 28. Ammonia. 29. Sulphuric acid. 30. Mercury. 31. White oxide of arſenic. 32. Acetate of ammonia. The three columns repreſent the mode of characterizing the three ſtates of aggregation of each of theſe ſubſtances.

Primary Compounds.

33. Ammonia. 34. Carburet of iron. 35. Light hydro-carbonous oxide. 36. Heavy hydro-carbonous oxide. 37. Sulphuretted phoſphorus. 38. Phoſphuretted ſulphur. 39. Amalgam of gold. 40. Alloy of ſilver and copper. 41. Glaſs. 42. Liquor ſilicum.

Secondary Compounds.

43. Sulphate of potaſs. 44. Sulphate of potaſs. 45. Super-ſulphate of potaſs. 46. Sulphate of alumina. 47. Super-ſulphate of alumina and potaſs, alum. 48. Nitrate of potaſs. 49. Muriate of ammonia. 50. Hyper-oxygenized muriate of potaſs. 51. Tartrate of ſoda and potaſs. 52. Sub-borate of ſoda. 53. Sub-muriate of mercury leſs oxidized, calomel. 54. Muriate of mercury more oxidized, corroſive ſublimate. 55. Green ſulphate of iron. 56. Brown ſulphate of iron. 57. Tartrate of antimony and potaſs. 58. Sub-acetate of copper. 59. Acetate of copper. 60. Soap of ſoda. 61. Soap of ammonia. 62. Hydroguretted ſulphuret of potaſs. 63. Litharge plaſter. 64. Ammoniuret of gold. 65. Fulminating gold.

PART II.

MATERIA MEDICA.

THE Materia Medica comprehends every ſubſtance, whether natural or artificial, which is employed in medicine. But in moſt Pharmacopœias the materia medica is confined to ſimples, and to thoſe preparations which are not ſuppoſed to be prepared by the apothecary himſelf, but to be purchaſed by him as articles of commerce from druggiſts and others.

Writers on the materia medica have beſtowed much pains on contriving ſcientific arrangements of theſe articles. Some have arranged them according to their natural reſemblances; others according to their active conſtituent principles; and others according to their real or ſuppoſed virtues. Each of theſe arrangements has its particular advantages. The firſt will probably be preferred by the natural hiſtorian, the ſecond by the chemiſt, and the laſt by the phyſiologiſt. But no arrangement has yet been propoſed which is not liable to numerous objections. Accordingly, in the Pharmacopœias publiſhed by the Colleges of Phyſicians of London, Dublin, and Edinburgh, the articles of the materia medica are arranged in alphabetical order; and the ſame plan is now alſo adopted in almoſt every Pharmacopœia publiſhed on the Continent of Europe. I ſhall therefore follow the ſame plan, ſubjoining to the name of each article a ſhort view of its natural, medical, and pharmaceutical hiſtory, and in forming the dictionary of materia medica, I ſhall generally adopt the nomenclature of the Edinburgh College, and ſhall include in it every article which is admitted by any one of the Britiſh colleges.

In an appendix, I ſhall give a very conciſe account of ſuch other ſubſtances, as, from their poſſeſſing a place in ſome reſpectable foreign Pharmacopœias, or from their active properties, ſeem of ſufficient importance to be noticed. But to conjoin with the hiſtory of the materia medica, given in alphabetical order, the advantages of other methods, I ſhall add ſome of thoſe arrangements which ſeem moſt uſeful.

ACIDUM ACETOSUM IMPURUM. (*Ed.*) Syn. *Acetum Vini.* (*Dub.*) *Acetum.* (*Lond.*)

Vinegar. Impure acetous acid.

VINEGAR, as obtained by the fermentation of vinous liquors, beſides the pure acetic acid (274.) diluted with much water, contains tartaric acid, tartrate of potaſs, mucilaginous matters, and ſometimes phoſphoric acid. The leaſt impure is that prepared from white wine. It ſhould be of a pale yellow colour, perfectly tranſparent, of a pleaſant, ſomewhat pungent, acid taſte, but without any acrimony. From the mucilaginous impurities which all vinegars contain, they are apt, on expoſure to the air, to become turbid and ropy, and at laſt vapid. This inconvenience is beſt obviated by keeping them in bottles completely filled and well corked. They are ſaid to keep better if they are boiled a few minutes before they be corked.

Vinegar is ſometimes adulterated with ſulphuric acid. Its preſence is detected, if on the addition of a ſolution of nitrate of baryta to the ſuſpected vinegar, a white precipitate is formed, which is inſoluble in nitric acid, after having been burnt in the fire. With the ſame intention of making the vinegar appear ſtronger, different acrid vegetables are occaſionally infuſed in it. This fraud is difficult of detection; but when taſted with attention, the pungency of ſuch vinegar will be found to depend rather on acrimony than acidity.

Vinegar poſſeſſes ſtrong antiſeptic powers on dead animal and vegetable matters. Hence its employment in pickling. The fine green colour ſo much admired in ſome vegetable pickles is often improperly given them by means of copper. This poiſonous addition is eaſily detected, on dropping ſome carbonate of ammonia into the ſuſpected vinegar, by the fine blue colour produced.

Medicinal uſes. Its action on the living body is gently ſtimulant and aſtringent. It promotes tranſpiration and the diſcharge by urine; and uſed moderately as a condiment, it facilitates digeſtion.

Vinegar is employed as a uſeful addition to drink in inflammatory fevers, in the proportion of about an ounce to a quart. As a medicine, it is uſed in putrid diſeaſes, in ſcurvy, and to counteract the effects of narcotic poiſons and mephitic vapours. In the form of glyſter, it is uſed in the ſame diſeaſes, and in obſtinate conſtipation. Externally, it is applied in fomentations and baths, as a ſtimulent and diſcutient; and its vapour is inhaled in putrid ſore throat, and diffuſed through the chambers of the ſick to correct the putreſcency of the atmoſphere.

Officinal preparations. Acidum acetoſum deſtillatum; *Ed. Lond. Dub.* Acid. acet. aromaticum; *Ed.* Acid. acetos. forte; *Ed.* Acid. acet. camphoratum; *Ed.* Syrupus acidi acetoſi; *Ed.* Mel acetat; *Lond. Dub.* Syr. colchici; *E.* Oxymel colchici; *Lond.* Oxymel ſcillæ; *Lond.* Oxymel æruginis; *Lond.* Acetum ſcillæ; *Lond. Dub.* Cataplas. ſinap.; *Lond. Dub.* Cerat ſaponis; *Lond. Dub.*

ACIDUM SULPHURICUM. (*Ed.*) Syn. *Acidum vitriolicum,* (Lond. Dub.) *Oleum vitrioli.*

Sulphuric acid, *Vitriolic acid, oil of vitriol.*

The London and Edinburgh Colleges direct, that in the ſhops, its ſpecific gravity ſhould be to that of water as 1850 to 1000; the Dublin College as 1845 to 1000. This want of uniformity is to be regretted.

The phyſical and chemical properties of this acid have been already (204) enumerated. As it is prepared by the trading chemiſt, it is inſerted among the materia medica. It is obtained in two ways; by diſtilling off the acid from ſulphate of iron, previouſly deprived of its water of cryſtallization by heat, or by burning ſulphur in large leaden chambers, with an eighth part of nitrate of potaſs to ſupply the neceſſary oxygen. In the firſt way the ſtrongeſt acid is obtained, but it is apt to contain iron or copper. By the ſecond proceſs it generally contains lead, which is eaſily detected by mixing a portion of the acid with three parts of diſtilled water, and if the acid be impure, a depoſition will be formed. It may be rendered perfectly pure by diſtillation, filling a retort half full of the common acid, and diſtilling in a ſand-bath, gradually heated as long as any acid comes over. The receiver ſhould not be luted on.

Sulphuric acid powerfully decompoſes dead animal matter. It becomes diluted with water formed by the union of the hydrogen and oxygen; another portion of the hydrogen combines with the azote to form ammonia, and the carbon is ſeparated in the ſtate of charcoal. The affinities which regulate this action are ſo powerful, that it produces the ſame effects on the living ſolid, and therefore it acts upon them as a corroſive. But to its employment with this view, its fluidity is an objection, as it cannot be eaſily managed.

Medical uſes. When ſufficiently diluted, it is an excellent tonic, checking fermentation, exciting appetite, promoting digeſtion, and quenching thirſt, and it is therefore uſed with ſucceſs in morbid acidity, weakneſs, and relaxation of the ſtomach. As an aſtringent, it is uſed in hæmorrhagies; and from its refrigerant and antiſeptic properties, it is a valuable medicine in many febrile diſeaſes, eſpecially thoſe called putrid. If taken in any conſiderable quantity, or for ſome time, it ſeems to paſs off undecompoſed by the kidneys or ſkin; and it is perhaps by its ſtimulant action on the latter, that it is advantageouſly employed internally, in pſora, and other cutaneous affections. The beſt mode of preſcribing it, is to order the quantity of acid to be uſed, and to direct it to be mixed with as much water as will render it palatable, to which ſome ſyrup or mucilage may be added. To prevent it from attacking the teeth, it may be conveniently ſucked through a quill, and the mouth ſhould be carefully waſhed after each doſe.

Externally it is uſed as a gargle, particularly in putrid ſore throats, and in aphthous mouths, and as a waſh in cutaneous eruptions, and ill-conditioned ulcers. Made into an ointment with ſixteen times its weight of axunge it has been uſed to cure pſora.

Off. Prep. Acid. ſulph. dilutum; *Ed. Lond. Dub.* Acid. ſulph. aromaticum; *Ed.* It is alſo uſed in the preparation of Acid nitr. *Ed. Lond. Dub.* Acid. muriat; *Ed. Lond. Dub.* Aqua ſupercarb. potaſſæ; *Ed.* Sulphas potaſſæ; *Ed.* Phoſphas ſodæ; *Ed.* Murias antim. *Ed. Lond. Dub.* Sulphas ferri. *Ed. Lond. Dub.* Murias hydrarg. *Ed. Lond. Dub.* Sub-ſulphas hydrarg. flavus; *Ed. Lond. Dub.* Aeth. ſulph. *Ed. Lond. Dub.*

ACIPENSER HUSO and RUTHENUS, *Ichthyocolla*, (*Lond. Dub.*)

The Beluga or Iſinglas fiſh. The Sterlet. Iſinglas.

Piſces Branchioſtegi, Cuvier.

Beſides thoſe mentioned by the London College, iſinglaſs is prepared from other ſpecies of acipenſer, eſpecially *A. ſturio*, the Sturgeon, and *A. ſtellatus* the Serruga.

The preparation of iſinglas is almoſt peculiar to Ruſſia. It is made in all places where the large ſpecies of ſturgeon are caught, as on the Dnieper, the Don, and eſpecially on the Caſpian ſea, alſo on the Volga, the Ural, the Oby, and the Irtyſh. That prepared from the ſturgeon is reckoned the beſt, and next to it that from the beluga. It alſo varies according to the mode of preparation. On the Volga and Ural, the ſounds are watered while freſh, and dried to a certain degree. The outer ſkin is next taken off, and the inner gloſſy white membrane is twiſted into proper ſhapes, and then completely dried. The beſt is uſually rolled into the form of a ſnake or heart; the ſecond folded in leaves, like a book; and the worſt is dried without any care. In other places, as at Gurief, fiſh glue is extracted from the ſounds by boiling. This is cut into ſlabs or plates, is perfectly tranſparent, and has the colour of amber. On the Okka, where the ſterlet only is to be had, the ſounds are beat juſt as they are extracted from the fiſh, and dried into glue.

Good iſinglas is white, in ſome degree tranſparent, dry, compoſed of membranes not too thick, and without any ſmell.

The properties of iſinglas depend entirely on the gelatin, of which it principally conſiſts. One hundred grains of good iſinglas was found by Mr. Hatchett to contain rather more than 98 of matter ſoluble in water. A nutritious jelly may be prepared from it. A watery ſolution of it is uſed as a teſt of the preſence of tannin, and for the clarification of ſpirituous liquors. Mr. Davy's ſolution for the former purpoſe conſiſts of 120 grains of iſinglas diſſolved in twenty ounces of water, and if properly made, at temperatures below 50 F. it has a tendency to gelatinize.

It is alſo ſaid to be employed for the preparation of Engliſh court-plaſter.

ACONITUM NEOMONTANUM. *Aconitum Herba.* (*Lond.*) *Folia.* (*Dub.*) *A. Napellus Folia.* (*Ed.*)

Large blue Wolfsbane, Monk's-hood, Aconite. The root.

Linnæi Species Plantarum, edit. Willdenow, genus 1062. *ſpecies* 9. *Polyandria Trigynia.*—Nat. ord. *Multiſiliquæ.*

This we are aſſured by Willdenow is the ſpecies of aconite which has always been uſed in medicine, although it is almoſt univerſally known by the name of Aconitum Napellus in conſequence of a botanical error of Stoerk, who introduced it into practice.

It is a perennial plant, found in the Alpine foreſts of Carinthia, Carniolia, and other mountainous countries in Germany, and cultivated in our gardens.

The freſh plant and root are very violent poiſons, producing remarkable debility, paralyſis of the limbs, convulſive motions of the face, bilious vomiting, and catharaſis, vertigo, delirium, aſphyxia, death. The freſh leaves have very little ſmell, but when chewed have an acrid taſte, and excite lancinating pains, and ſwelling of the tongue. By drying, its acrimony is almoſt entirely deſtroyed. For medical uſe the plant muſt be gathered before the ſtem ſhoots.

Uſes and doſe. When properly adminiſtered, it acts as a penetrating ſtimulus, and generally excites ſweat, and ſometimes an increaſed diſcharge of urine.

On many occaſions, it has been found a very effectual remedy in glandular ſwellings, veneral nodes, anchyloſis, ſpina ventoſa, itch, amauroſis, gouty and rheumatic pains, intermittent fevers, and convulſive diſorders.

We may begin by giving one or two grains of the dried leaves in powder, but it is commonly uſed in the form of an inſpiſſated juice. As ſoon as the plant is gathered, the juice is expreſſed, and evaporated without any previous clarification, to the conſiſtence of an extract. It is an unfortunate circumſtance, that the powers of this medicine vary very much, according to its age and the heat employed in its preparation. When recently prepared, its action is often too violent, and when kept more than an year it becomes totally inert. It may therefore be laid down as a univerſal rule, in the employment of this and of many other ſimilar active medicines, to begin with very ſmall doſes, and to increaſe them gradually to the neceſſary degree; and whenever we have occaſion to begin a new parcel of the medicine, we ſhould again commence with the ſmalleſt doſe, and proceed with the ſame caution as at firſt.

We may begin by giving half a grain of this extract, either formed into a powder with ten grains of white ſugar, or made up with any convenient addition into a pill, twice or thrice a day, and gradually increaſe the doſe: Or a tincture of aconite may be prepared by digeſting one part of the dried leaves in ſix parts of ſpirit of wine; the doſe of which will be at firſt five or ten drops, and may be gradually increaſed to forty.

Off. Prep. Succus ſpiſſatus aconiti napelli, (*Ed.*)

ACORUS CALAMUS.—(*Edin.*) *Radix. Calamus aromaticus.* (*Lond. Dub.*)

Sweet flag. The root.

Willd. g. 663. *ſp.* 1.—*Hexandria Monogynia.*—Nat. ord. *Piperitæ.*

This plant is perennial, and grows plentifully in rivulets and marſhy places about Norwich and other parts of England, in the canals of Holland, in Switzerland, and in other countries of Europe. The ſhops have been uſually ſupplied from the Levant with dried roots, which do not appear to be ſuperior to thoſe of our own growth.

The root of acorus is full of joints, crooked, ſomewhat flatted on the ſides, internally of a white colour, and looſe ſpongy texture; its ſmell is ſtrong; the taſte warm, acrid, bitteriſh, and aromatic; both the ſmell and taſte are improved by exſiccation. This root is generally looked upon as a carminative and ſtomachic medicine, and as ſuch is ſometimes made uſe of in practice. It is ſaid by ſome to be ſuperior in aromatic flavour to any other vegetable that is produced in theſe northern climes; but this aſſertion is by no means ſtrictly true. It is nevertheleſs, a ſufficiently elegant aromatic. The freſh root, candied, is ſaid to be employed at Conſtantinople as a preſervative againſt epidemic diſeaſes. The leaves of this plant have a ſweet flagrant ſmell, more agreeable, though weaker, than that of the roots.

Neumann obtained by diſtillation about two ſcruples of fragrant volatile oil from ſixteen ounces of the dried root. It alſo roſe in diſtillation with water, but not with alcohol. The ſpirituous extract from two ounces weighed 370 grains, and water extracted from the reſiduum 190 grains. The watery extract from two ounces weighed 455 grains, and the reſiduum gave out to alcohol 43.

ÆSCULUS HIPPOCASTANUM. (*Ed.*) *Semen, Cortex.*
Horſe cheſnut, the fruit and bark.
Willd. g. 717. *ſp.* 1. *Heptandria Monogynia.*—Nat. ord. *Tribilatæ.*

This is a very common and well-known tree. The fruit, which probably contains much amylaceous matter, has been uſed as food for domeſtic animals, and even for men, in times of ſcarcity. But its introduction into the Edinburgh Pharmacopeia, was probably owing to its having been uſed and recommended as a ſternutatory in ſome caſes of ophthalmia and headach. With this view it was drawn up the noſtrils in the form of an infuſion or decoction.

The bark has been propoſed as an indigenous ſubſtitute for the very expenſive and often adulterated Peruvian bark. Many ſucceſsful experiments of its effects, when given internally in intermittent and typhous fever, and alſo when applied externally in gangrene, ſufficiently warrant future trials. Although chemical analyſis is not yet ſufficiently advanced to enable us to determine from it the medical uſes of any ſubſtance, I muſt obſerve, that the active conſtituent of this bark is tannin, which is incompatible with the preſence of Cinchonin, the predominant, and probably the active conſtituent, of Peruvian bark. In powder it may be given to the extent of a ſcruple and a half, or a drachm for a doſe. Buchholz prefers a ſolution of a drachm of the extract in an ounce of cinnamon water, of which ſixty drops are to be given every three hours.

ALCOHOL. (*Ed.*) *Spiritus vinoſus rectificatus,* (*Lond.*) *Spiritus vini rectificatus,* (*Dub.*)
Alcohol, rectified ſpirit of wine.

The ſpirit diſtilled from wine or other fermented liquors, perfectly free from any unpleaſant ſmell, and of which the ſpecific gravity is to that of water as 835 to 1000, ſuch as may be eaſily procured. (*Ed.*) The London college order a ſpirit of the ſame ſpecific gravity, and add, that it contains 95 parts of pure alcohol, and 5 of water. The Dublin college order it of the ſpecific gravity 840.

Alcohol forms the true characteriſtic of vinous liquors, and ariſes from the decompoſition of ſugar, being always in proportion to its quantity. It is found in greateſt quantity in the wines of warm countries, and in wines prepared from thoroughly-ripen-ed fruit. In the ſouth of France, ſome wines yield a third of brandy. It is the proportion of alcohol which renders wines more or leſs generous, and prevents them from becoming ſour. The richer a wine is in alcohol, the leſs malic acid it contains, and, therefore, the beſt wines give the beſt brandy, becauſe they are free from the diſagreeable taſte which the malic acid imparts to them. Old wines give better brandy than new wines, but leſs of it.

Alcohol is procured from wine by diſtillation; in conducting which, the following rules are to be obſerved:

1. To heat the whole maſs of fluid at once, and equally.
2. To remove all obſtacles to the aſcent of the vapour.
3. To condenſe the vapour as quickly as poſſible.

The diſtillation is continued until the liquor which comes over is not inflammable.

Baumé mentions a very remarkable fact concerning the preparation of alcohol. He diſtilled two pounds of alcohol, ſp. gr. 832, in the water bath, and filled the refrigeratory with ice, and he obtained two pounds four ounces of an alcohol having only ſp. gr. 862. This he aſcribes to water condenſed from the air in the worm by the coldneſs of the ice, and he aſſures us from experience, that to get an alcohol of 827, it is abſolutely neceſſary that the refrigeratory be filled with water of 145° F.

Diſtillers judge of the ſtrength of their ſpirits by the ſize and durability of the bubbles it forms, when poured from one veſſel into another, or in agitating it in a veſſel partly filled. Another proof is, by the combuſtion of gunpowder: ſome of which is put in a ſpoon; it is then covered with the ſpirit to be tried, which is ſet on fire; if it kindle the gunpowder, it is ſuppoſed to be ſtrong, and *vice verſa.* But a ſmall quantity of ſpirits will always kindle gunpowder, and a large quantity never. Another proof is, by the carbonate of potaſs, which attracts the water, and diſſolves in it, while the alcohol ſwims above. But all theſe are uncertain; and dependence can only be put in the proof by hydrometers, or ſome ſuch contrivance, for aſcertaining the weight of a given quantity at a given temperature.

In this country, alcohol is procured from an infuſion of malt, and before its rectification is termed Whiſky. In the Eaſt-Indies, arrack is diſtilled from rice; in the Weſt-Indies, rum from the ſugar-cane; and in France and Spain, brandy from wine. Of all theſe, the French brandy is the fineſt ſpirit; for the others are more or leſs impregnated with eſſential oils, of which it is almoſt impoſſible to free them entirely. When any ardent ſpirit is rediſtilled to procure alcohol, the water-bath is commonly uſed, which gives a more equal and temperate heat, and improves the product, Gren ſays, that the addition of four pounds of well-burnt charcoal, and three or four ounces of ſulphuric acid, previous to this rectification, deſtroys entirely the peculiar taſte of malt ſpirit; and that a ſecond rectification with one pound of charcoal, and two ounces of ſulphuric acid, affords an alcohol of very great purity. But the affinity of alcohol for water is ſo very ſtrong, that it cannot be obtained entirely free from it by ſimple diſtillation. We muſt, therefore, abſtract the water by means of ſome ſubſtance which has a ſtronger affinity for it than alcohol has. Carbonate of potaſs was formerly employed; but muriate of lime is preferable, becauſe its affinity for water is not only very great, but by being ſoluble in alcohol, it comes in contact with every particle of the fluid. For this purpoſe, one part of muriate of lime, rendered perfectly dry by having been expoſed to a red heat, and powdered after it becomes cold, is put into the ſtill. Over this three parts of highly rectified ſpirits are to be poured, and the mixture well agitated. By diſtillation with a very gentle heat, about two-thirds of the ſpirit will be obtained in the ſtate of perfectly pure alcohol.

The chemical properties of alcohol have been already mentioned, (240.)

Medical Uſes.—On the living body alcohol acts as a moſt violent ſtimulus. It coagulates all the albuminous and gelatinous fluids, and corrugates all the ſolids. Applied externally, it ſtrengthens the veſſels, and thus may reſtrain paſſive hæmorrhagies. It inſtantly contracts the extremities of the nerves it touches, and deprives them of ſenſe and motion; by this means eaſing them of pain, but at the ſame time deſtroying their uſe. Hence employing ſpiritous liquors in fomentations, notwithſtanding the ſpecious titles of vivifying, heating, reſtoring mobility, reſolving, diſſipating, and the like, uſually attributed to them, may ſometimes be attended with unhappy conſequences. Theſe liquors received undiluted into the ſtomach, produce the ſame effects, contracting all the ſolid parts which they touch, and deſtroying, at leaſt for a time, their uſe and office: if the quantity be conſiderable, a palſy or apoplexy follows, which ends in death. Taken in ſmall quantity, and duly diluted, they act as a cordial and tonic: if farther continued, the ſenſes are diſordered, voluntary motion deſtroyed, and at length the ſame inconveniences brought on as before. Vinous ſpirits, therefore, in ſmall doſes, and properly diluted, may be applied to uſeful purpoſes in the cure of diſeaſes; whilſt in larger ones they produce the moſt deleterious effects.

Off. prep.—Alcohol, L. D. Æther ſulph. E. L. D. Æth. ſulph. cum alcohole, E. L. D. Oleum vini, L. Spiritus æth. nitroſ. E. L. D. It alſo enters into the preparation of all tinctures and diſtilled ſpirits. It is uſed undiluted in tinct. aſſæ fœtid. E. L. D. T. Balſami Peruviani, L. T. Benzoes comp. L. E. T.

Camph. E. L. D. T. Guaiaci, E. T. Moſchi, D. T. Myrrhæ, D. T. Saponis, E. T. Toluiferae balſam, E. L. D. Spt. lavand. E. L. D. Spt. Roriſmar. E. L.

ALCOHOL DILUTUM. (*Ed.*) *Spiritus vinoſus tenuior.* (*Lond.*) *Spiritus vini tenuior.* (*Dub.*)

Diluted alcohol. Spirit of wine. Proof ſpirit.

Alcohol mixed with an equal quantity of water, being ſomewhat weaker than proof ſpirit; its ſpecific gravity is to that of diſtilled water, as 935 to 1000. (*Ed.*) The London and Dublin Colleges order it of the ſpecific gravity of 930, which according to the former contains 55 parts of pure alcohol, and 45 of water.

Although it be deſirable that diluted alcohol ſhould always be prepared, by mixing rectified ſpirit with water, inſtead of employing an impure ſpirit of the requiſite ſtrength, it is hardly to be expected that apothecaries will either be at the trouble or expence. The diluted alcohol of the Edinburgh college is ſomewhat weaker than that of the other two colleges; but beſides that it is more convenient for their mode of preparing it, this will be attended with no diſadvantage, as it is ſtill ſufficiently ſtrong for any purpoſe to which it may be applied.

Officinal preparations.—Alcohol ammon. E. L. D. and all the tinctures and diſtilled ſpirits, except thoſe made with alcohol. It is alſo uſed ſomewhat extravagantly in the preparation of various extracts.

Table of the Specific Gravities according to Gilpin, and degrees according to Baumé's hydrometer of various mixtures of Alcohol and Water.

Water.	Alcohol.	Specific Gravities.		Degrees.
		60°	55°	55°
0	100	.825	.82736	38
10	100	.84568	.84802	34+
20	100	.86208	.86441	30—
30	100	.87569	.87796	29+
40	100	.88720	.88945	27+
50	100	.89707	.89933	25+
60	100	.90549	.90768	23—
70	100	.91287	.91502	22
80	100	.91933	.92145	21—
90	100	.92499	.92707	20—
100	100	.93002	.93208	19—
100	90	.93493	.93696	19+
100	80	.94018	.94213	18
100	70	.94579	.94767	17—

WATER.	ALCOHOL.	SPECIFIC GRAVITIES.		DEGREES.
		60°	55°	55°
100	60	·95181	·95357	16—
100	50	·95804	·95966	16+
100	40	·96437	·96575	15+
100	30	·97074	·97181	14+
100	20	·97771	·97847	13+
100	10	·98654	·98702	12+
100	0	1.		10

ALLIUM.

Willd. g. 626.—*Hexandria Monogynia.*—Nat. ord. *Liliaceæ.*

Sp. 14. ALLIUM SATIVUM. *Radix.* (*Ed.*) *Allium. Radix.* (*Lond. Dub.*)

Garlic. The root.

THE garlic is a perennial bulbous-rooted plant, which grows wild in Sicily, and is cultivated in our gardens. The root conſiſts of five or ſix ſmall bulbs, called *cloves*, incloſed in one common membranous coat, but eaſily ſeparable from each other. All the parts of this plant, but more eſpecially the roots, have a ſtrong offenſive, very penetrating and diffuſible, ſmell, and an acrimonious, almoſt cauſtic, taſte. The root is full of a limpid juice, of which it furniſhes almoſt a fourth part of its weight by expreſſion. The root loſes about half its weight by drying, but ſcarcely any of its ſmell or taſte. By decoction its virtues are entirely deſtroyed; and by diſtillation it furniſhes a ſmall quantity of a yellowiſh eſſential oil, heavier than water, which poſſeſſes the ſenſible qualities of the garlic in an eminent degree. Its peculiar virtues are alſo in ſome degree extracted by alcohol and acetous acid.

By Neumann's analyſis, it loſt two thirds of its weight by exſiccation. By decoction from 960 parts, water extracted 380, and the reſiduum yielded 27 to alcohol, and was reduced to 40. Alcohol applied firſt, extracted 123, the reſiduum yielded 162 to water, and was reduced to 40. In both caſes the alcoholic extract was unctuous and tenacious, and precipitated metallic ſolutions. But the active ingredient was a thick ropy eſſential oil, according to Hagen heavier than water, not amounting to more than 1.3 of the whole, in which alone reſided the ſmell, the taſte, and all that diſtinguiſhes the garlic.

Medical Uſe.—Applied externally, it acts ſucceſſively as a ſtimulant, rubefacient, and bliſter. Internally, from its very powerful and diffuſible ſtimulus, it is often uſeful in diſeaſes of languid circulation and interrupted ſecretion. Hence, in cold leucophlegmatic habits, it proves a powerful expectorant, diuretic, and, if the patient be kept warm, ſudorific; it has alſo been by ſome ſuppoſed to be emmenagogue. For the ſame reaſon, in caſes in which a phlogiſtic diatheſis, or other irritability prevails, large doſes of it may be very hurtful.

It is ſometimes uſed by the lower claſſes as a condiment, and alſo enters as an ingredient into many of the epicure's moſt favourite ſauces. Taken in moderation, it promotes digeſtion; but in exceſs, it is apt to produce headach, flatulence, thirſt, febrile heat, and inflammatory diſeaſes, and ſometimes occaſions a diſcharge of blood from the hæmorrhoidal veſſels.

In fevers of the typhoid type, and even in the plague itſelf, its virtues have been much celebrated.

Garlic is with ſome alſo a favourite remedy in the cure of intermittents; and it has been ſaid to have ſometimes ſucceeded in obſtinate quartans, after the Peruvian bark had failed. In catarrhal diſorders of the breaſt; aſthma, both pituitous and ſpaſmodic; flatulent colics; hyſterical and other diſeaſes, proceeding from laxity of the ſolids, it has generally good effects: it has likewiſe been found ſerviceable in ſome hydropic caſes. Sydenham relates, that he has known the dropſy cured by the uſe of garlic alone; he recommends it chiefly as a warm ſtrengthening medicine in the beginning of the diſeaſe.

It is much recommended by ſome as an anthelmintic, and has been frequently applied with ſucceſs externally as a ſtimulant to indolent tumours, in caſes of deafneſs proceeding from atony or rheumatiſm, and in retention of urine, ariſing from debility of the bladder.

Garlic may be either exhibited in ſubſtance, and in this way ſeveral cloves may be taken at a time without inconvenience, or the cloves cut into ſlices may be ſwallowed without chewing. This is the common mode of exhibiting it for the cure of intermittents.

The expreſſed juice, when given internally, muſt be rendered as palatable as poſſible by the addition of ſugar and lemon juice. In deafneſs, cotton moiſtened with the juice is introduced within the ear, and the application renewed five or ſix times in one day.

Infuſions in ſpirit, wine, vinegar, and water, although containing the whole of its virtues, are ſo acrimonious, as to be unfit for general uſe; and yet an infuſion of an ounce of bruiſed garlic in a pound of milk, was the mode in which Roſenſtein exhibited it to children afflicted with worms.

But by far the moſt commodious form for adminiſtering garlic, is that of a pill or bolus conjoined with ſome powder, correſponding with the intention of giving the garlic. In dropſy, calomel forms a moſt uſeful addition. It may alſo ſometimes be exhibited with advantage in the form of a clyſter.

Garlic made into an ointment with oils, &c. and applied externally, is ſaid to reſolve and diſcuſs indolent tumours, and has been by ſome greatly eſteemed in cutaneous diſeaſes. It is likewiſe ſometimes been employed as a repellent. When applied under the form of a poultice to the pubis, it has ſometimes proved effectual in producing a diſcharge of urine, when retention has ariſen from a want of due action in the bladder. Sydenham aſſures us, that among all the ſubſtances which occaſion a derivation or revulſion from the head, none operates more powerfully than garlic applied to the ſoles of the feet: he was led to make uſe of it in the confluent ſmall pox: about the eight day, after the face began to ſwell, the root cut in pieces, and tied in a linen cloth, was applied to the ſoles, and renewed once a-day till all danger was over.

Sp. 43. Allium Cepa. *Cepa. Radix.* (*Dub.*)
Onion. The root.

This is alſo a perennial bulbous-rooted plant. The root is a ſimple bulb, formed of concentric circles. It poſſeſſes in general the ſame properties as the garlic, but in a much weaker degree. Neumann extracted from 480 parts of the dry root, by means of alcohol, 360, and then by water 30; by water applied firſt 395, and then by alcohol, 30: the firſt reſiduum weighed 56, and the ſecond 64. By diſtillation the whole flavour of the onions paſſed over, but no oil could be obtained.

Medical Uſes.—Onions are conſidered rather as articles of food than of medicine: they are ſuppoſed to yield little or no nouriſhment, and when eaten liberally produce flatulencies, occaſion thirſt, headachs, and turbulent dreams; in cold phlegmatic habits, where viſcid mucus abounds, they doubtleſs have their uſe; as by their ſtimulating quality they tend to excite appetite, and promote the ſecretions: by ſome they are ſtrongly recommended in ſuppreſſions of urine and in dropſies. The chief medicinal uſe of onions in the preſent practice is in external applications, as a cataplaſm for ſuppurating tumours, &c.

ALOE PERFOLIATA. *Gummi-Reſina.* (*Ed.*)
a. *Aloe Barbadenſis.* (*Lond. Dub.*) *A. hepatica.* (*Ed.*)
b. *Aloe Socotorina.* (*Lond. Dub. Ed.*)
Barbadoes, or hepatic, and ſocotorine aloes. A gum-reſin.
Willd. g. 659. *ſp.* 3.—*Hexandria Monogynia.*—Nat. ord. *Liliaceæ.*

A perennial plant, of which there are many varieties which grow in the ſouth of Europe, Aſia, Africa, and America. But Thunberg ſays, that the fineſt aloes are prepared from the *Aloe ſpicata*, the ſecond ſpecies of Willdenow, which grows at the Cape of Good Hope.

During four years that the Cape of Good Hope was in poſſeſſion of the Britiſh, more than 300,000 pounds, the produce of that ſettlement were imported into England; and as this quantity was infinitely greater than could be required for the purpoſes of medicine, it is not improbable, that, as Mr. Barrow ſtates, its principal conſumption was by the London porter brewers.

1. SOCOTORINE ALOES.

THIS article is brought, wrapt in ſkins, from the iſland of Socotora in the Indian ocean. This ſort is the pureſt of the three in uſe: it is of a gloſſy ſurface, clear, and in ſome degree pellucid: in the lump, of a yellowiſh red colour, with a purple caſt; when reduced to powder, of a bright golden colour. It is hard and friable in the winter, ſomewhat pliable in ſummer, and grows ſoft between the fingers. Its taſte is bitter, accompanied with an aromatic flavour, but inſufficient to prevent its being diſagreeable; the ſmell is not very unpleaſant, and ſomewhat reſembles that of myrrh.

It is prepared by pulling off the leaves in July, from which the juice is expreſſed, and afterwards boiled and ſkimmed. It is then preſerved in ſkins, and dried in Auguſt in the ſun. According to others, the leaves are cut off cloſe to the ſtem and hung up. The juice which drops from them without any expreſſion, is afterwards dried in the ſun.

2. BARBADOES, or HEPATIC ALOES.

HEPATIC aloes is not ſo clear and bright as the foregoing ſort; it is alſo of a darker colour, more compact texture, and for the moſt part drier. Its ſmell is much ſtronger and more diſagreeable; the taſte intenſely bitter and nauſeous, with little or nothing of the fine aromatic flavour of the ſocotorine. The beſt hepatic aloes comes from Barbadoes in large gourd ſhells, and an inferior ſort of it, which is generally ſoft and clammy, is brought over in caſks. In Barbadoes the plant is pulled up by the roots, and carefully cleaned from the earth and other impurities. It is then ſliced and cut in pieces into ſmall hand-baſkets and nets. Theſe nets or baſkets are put into large iron boilers or cauldrons with water, and boiled for ten minutes, when they are taken out, and freſh parcels ſupplied till the liquor is ſtrong and black.

At this period the liquor is thrown through a ſtrainer into a deep vat, narrow at bottom, where it is left to cool and to depoſite its feculent parts. Next day the clear liquor is drawn off by a cock, and again committed to a large iron veſſel. At firſt it is boiled briſkly, but towards the end the evaporation is ſlow, and requires conſtant ſtirring to prevent burning. When it becomes of the conſiſtence of honey, it is poured into gourds or calabaſhes for ſale, and hardens by age.

3. FETID, CABALLINE, or HORSE, ALOES.

THIS ſort is eaſily diſtinguiſhed from both the foregoing, by its ſtrong rank ſmell; although, in other reſpects, it agrees pretty much with the hepatic, and is not unfrequently ſold in its ſtead. Sometimes the caballine aloes is prepared ſo pure and bright, as not to be diſtinguiſhable by the eye even from the ſocotorine; but its offenſive ſmell, of which it cannot be diveſted, readily betrays it. It has not now a place in the liſt of almoſt any modern pharmacopœia, and is employed chiefly by farriers.

From ſixteen ounces of aloes Neumann extracted near fifteen by means of alcohol. From the reſiduum water took up one drachm, about an ounce of impurities being left; on inverting the procedure and applying water firſt, he obtained but thirteen ounces and a half of watery extract, and from the reſiduum alcohol diſſolved an ounce and a half. According to this analyſis 1000 parts of aloes contains about 78 ſoluble in water only, or analagous to gum, 980 ſoluble in alcohol only, or reſinous, and 895 ſoluble both in alcohol and in water, or extractive. The conſtituent principles of aloes therefore appear to be reſin and extractive. Dr Lewis alſo remarks that decoctions of aloes let fall a precipitate, as they cool, probably from extractive being more ſoluble in boiling than in cold water. He alſo proved the hepatic aloes to contain more reſin and leſs extractive than the ſocotorine, and this leſs than the caballine. The reſins of all the ſorts, purified by alcohol, have little ſmell; that obtained from the ſocotorine has ſcarce any perceptible taſte; that of the hepatic, a ſlight bitteriſh reliſh; and the reſin of the caballine, a little more of the aloetic flavour. The extractive obtained ſeparately from any of the kinds, is leſs diſagreeable than the crude aloes: the extractive of ſocotorine aloes has very little ſmell, and is in taſte not unpleaſant; that of the hepatic has a ſomewhat ſtronger ſmell, but is rather more agreeable in taſte than the extract of the ſocotorine: the extractive of the caballine retains a conſiderable ſhare of the peculiar rank ſmell of this ſort of aloes, but its taſte is not much more unpleaſant than that of the extractive obtained from the two other ſorts.

Medical uſe. Aloes is a bitter ſtimulating purgative. Its purgative effect ſeems chiefly to depend on its proving a ſtimulus to the rectum. In doſes of from 5 to 15 grains it empties the large inteſtines, without making the ſtools thin; and likewiſe warms the habit, quickens the circulation, and promotes the uterine and hæmorrhoidal fluxes. If given in ſo large a doſe as to purge effectually, it often occaſions an irritation about the anus, and ſometimes a diſcharge of blood.

Aloes is much leſs frequently uſed to operate as a purgative than merely to obviate coſtiveneſs; and indeed its purgative effect is not increaſed in proportion to the quantity that is taken.

It is frequently employed in caſes of ſuppreſſion of the menſes, or of the hæmorrhoidal diſcharge; but it is particularly ſerviceable in habitual coſtiveneſs, to perſons of a phlegmatic temperament and ſedentary life, and where the ſtomach is oppreſſed and weakened. Perhaps the chief objection to aloes, in caſes of habitual coſtiveneſs, is the tendency which it has to induce and augment hæmorrhoidal affections; and with thoſe, liable to ſuch complaints, it can ſeldom be employed. In dry bilious habits aloes proves injurious, immoderately heating the body, and inflaming the bowels.

Some are of opinion, that the purgative virtue of aloes reſides entirely in its reſin; but experience has ſhewn, that the pure reſin has little or no purgative quality, and that the extractive part ſeperated from the reſinous, acts more powerfully than the crude aloes. If the aloes indeed be made to undergo long coction in the preparation of the gummy extract, its cathartic power will be conſiderably leſſened, not from the ſeparation of the reſin, but from an alteration made in the extractive itſelf by the action of the heat and air. The ſtrongeſt vegetable cathartics become mild by a like treatment.

Socotorine aloes, as already obſerved, contains more extractive than the hepatic; and hence is likewiſe found to purge more, and with greater irritation. The firſt ſort, therefore, is moſt proper where a ſtimulus is required, as for promoting or exciting the menſtrual flux; whilſt the latter is better calculated to act as a common purge.

Aloes are adminiſtered either

a. Simply, or
b. In compoſition:
  1. With purgatives. Soap, ſcammony, colocynth, rhubarb.
  2. With aromatics. Canella.
  3. With bitters. Gentian.
  4. With emmenagogues. Iron, myrrh.

They are exhibited in the form of

a. Powder; too nauſeous for general uſe.
b. Pill; the moſt convenient form.
c. Solution in wine or diluted alcohol.

Off. prep. Pulv. cum canella, *Lond.*—cum Guaiaco, *Lond.*—cum ferro, *Lond.*—Scam. comp. cum aloe, *Lond.* Pilulae, *Ed. Lond. Dub.*—cum aſſa fœt. *Ed.*—cum colocynth, *Ed.*—cum myrrha, *Lond. Ed.* Pil. rhoei comp. *Ed.* Extract, *Dub.* Extract coloc. comp. *Lond.* Tinct. *Ed. Lond. Dub.*—cum myrrha, *Ed.* Tinct. benz. comp. *Lond. Ed.* T. rhei cum, A. *Ed.* T. A. æther, *Ed.* Vinum, *Ed. Lond. Dub.*

ALTHÆA OFFICINALIS. *Radix, Folia.* (*Ed.*)

Althæa. Radix, Folium. (*Lond.*)
Marſh-mallow. The root and leaves.
Willd. g. 1289. *ſp.* 1.—*Monadelphia Polyandria.*—Nat. ord. *Columnaceæ.*

The marſh-mallow is a perennial, indigenous plant, which is found commonly on the banks of rivers, and in ſalt marſhes.

The whole plant, but eſpecially the root, abounds with mucilage. The roots are about the thickneſs of a finger, long and fibrous. They are peeled and dried, andthen are perfectly white.

From 960 parts of the dry root, Neumann extracted by water 650, and afterwards with alcohol 41; by alcohol applied firſt 360, and afterwards by water 348. Lewis extracted by alcohol only 120, and he obſerved that the alcoholic extract was ſweeter than the watery, and had the ſmell peculiar to the root. The ſubſtance ſoluble in this inſtance, both in alcohol and water, is probably ſaccharine. From 960 parts of the dry leaves Neumann extracted by water 340, and then by alcohol 213; by alcohol firſt 280, and then by water 218. The reſiduum of the root was only one fourth of the leaves, one half of the whole. The root is therefore the moſt mucilaginous. The decoction of the root reddens turnſol, and gelatinizes ſilicized potaſs.

Med. uſe.—It is uſed as an emollient and demulcent, in diſeaſes attended with irritation and pain, as in various pulmonary complaints, and in affections of the alimentary canal and urinary organs; and itis applied externally in emollient fomentations, gargles, and clyſters.

Off. prep. Decoct. *Ed.* Syr. *Ed. Lond.*

AMMONIACUM. *Gummi-Reſina.* (*Lond. Dub. Ed.*)

Ammoniacum. A gum-reſin.

Ammoniacum is a concrete, gummy-reſinous juice, brought from the Eaſt Indies, uſually in large maſſes, compoſed of little lumps or tears, of a milky colour, but ſoon changing, upon being expoſed to the air, to a yellowiſh hue. We have no certain account of the plant which affords this juice; the ſeeds uſually found among the tears reſemble thoſe of the umbelliferous claſs. It has been alſo alleged, and not without ſome degree of probability, that it is an exudation from a ſpecies of the ferula, another ſpecies of which produces the aſſa fœtida. The plant producing it is ſaid to grow in Nubia, Abyſſinia, and the interior parts of Egypt. Such tears as are large, dry, free from little ſtones, ſeeds, or other impurities, ſhould be picked out and preferred for internal uſe; the coarſer kind is purified by ſolution, colature, and careful inſpiſſation; but unleſs this be artfully managed, the gum will loſe a conſiderable deal of its more volatile parts. There is often vended in the ſhops, under the name of ſtrained gum ammoniacum, a compoſition of ingredients much inferior in virtue.

Ammoniacum has a nauſeous ſweet taſte, followed by a bitter one; and a peculiar ſmell, ſomewhat like that of galbanum, but more grateful: it ſoftens in the mouth, and grows of a white colour upon being chewed. It ſoftens by heat, but is not fuſible; when thrown upon live coals, it burns away in flame; it is in ſome degree ſoluble in water and in vinegar, with which it aſſumes the appearance of milk; but the reſinous part, amounting to about one half, ſubſides on ſtanding.

Neumann extracted from 480 parts, 360 by alcohol, and then by water 105; by water applied firſt 410, and then by alcohol 60. Alcohol diſtilled from it aroſe unchanged, but water acquired a ſweetiſh taſte, and the ſmell of the ammoniac. The ſolution in alcohol is tranſparent; but on the addition of water becomes milky. It therefore ſeems to conſiſt principally of a ſubſtance ſoluble both in water and in alcohol, combined with ſome volatile matter.

Medical uſe.—The general action of gum-ammoniac is ſtimulant. On many occaſions, in doſes of from ten to thirty grains, it proves a valuable antiſpaſmodic, deobſtruent, or expectorant. In large doſes it purges gently, excites perſpiration, and increaſes the flow of urine. It is uſed with advantage to promote expectoration in ſome pulmonary diſeaſes; in dropſical affections, to augment the flow of urine, and to ſupport the ſalivation in ſmall pox. It is alſo an uſeful deobſtruent; and is frequently preſcribed for removing obſtructions of the abdominal viſcera, and in hyſterical diſorders occaſioned by a deficiency of the menſtrual evacuations. In long and obſtinate colics, proceeding from viſcid matter lodged in the inteſtines, this gummy-reſin has produced happy effects, after purges and the common carminatives had been uſed in vain. Externally, it is ſuppoſed to ſoften and ripen hard tumours. A ſolution of it in vinegar has been recommended by ſome for reſolving even ſcirrhous ſwellings.

It is exhibited internally,

a. In ſolution, combined with vinegar, vinegar of ſquills, aſſa fœtida, &c.

b. In pills, with bitter extracts, myrrh, aſſa fœtida.

c. And externally combined with vinegar, turpentine, common plaſter, &c.

Off. prep. Ammon. purif. *Lond.* Lac. am. *Lond. Dub.* Pil. ſcill. *Ed. Lond. Dub.* Emp. gum. *Ed.* Empl. A cum hydrarg. *Lond.*

AMOMUM.

Willd. g. 4.—*Monandria Monogynia.*—Nat. ord. *Scitamineæ.*

Sp. 1. Amomum Zingiber. *Radix ſiccata, et radix condita ex India allata.* (*Ed.*)

Zingiber. Radix. (*Lond.*) *Radix, Radix condita.* (*Dub.*)

Ginger. The root, and the candied root brought from India.

Ginger is a perennial plant, indigenous in the Eaſt Indies, but now cultivated in the Weſt-India iſlands. It is cultivated there very much in the ſame manner as potatoes are here, and is fit for digging once a year, unleſs for preſerving in ſyrup, when it ſhould be dug at the end of three or four months, at which time it is tender and full of ſap.

Ginger is diſtinguiſhed into two ſorts, the black and the white. The former is rendered fit for preſervation by means of boiling water, the latter by inſolation; and as it is neceſſary to ſelect the faireſt and roundeſt ſorts for expoſure to the ſun, white ginger is commonly one third dearer than black.

Black ginger conſiſts of thick and knotty roots, internally of an orange or browniſh colour, externally of a yellow-grey. White ginger is leſs thick and knotty, internally of a reddiſh yellow, and externally of a whitiſh-grey or yellow. It is firm and reſinous, and more pungent than the black. Pieces which are worm-eaten, light, friable, or ſoft, and very fibrous, are to be rejected.

Candied ginger ſhould be prepared in India from the young and ſucculent roots. When genuine, it is almoſt tranſparent. That manufactured in Europe is opaque and fibrous.

Ginger has a fragrant ſmell, and a hot, biting, aromatic, taſte. Neumann obtained by diſtillation with water from 7680 parts of white ginger, about 60 of an eſſential oil, having the ſmell and diſtinguiſhing flavour of the ginger, but none of its pungency. The watery extract was conſiderably pungent, and amounted to 2720, after which, alcohol extracted 192 of a very pungent reſin. Alcohol applied firſt extracted 660 of pungent reſin, and water afterwards 2160 of a mucilaginous extract with little taſte and difficultly exſiccated. The black ginger contained leſs ſoluble matter than the white.

Medical uſe.—Ginger is a very uſeful ſpice in cold flatulent colics, and in laxity and debility of the inteſtines: it does not heat ſo much as thoſe of the pepper kind, but its effects are more durable.

It may alſo be applied externally as a rubefacient.

Off. prep. Syr. *Ed.* Tinct. *Lond.* It is alſo an ingredient in pulv. arom. *Lond. Dub. Ed.* Pulv. ſcam. comp. *Lond. Dub.* Pulv. ſcam. c. cum aloe, *Lond.* Pulv. ſennæ comp. *Lond.* Elect. arom. *Dub.* Elect. ſcammon. *Lond. Dub.* Confectio opiat. *Lond.* Troch. magnes, *Lond.* Pil. aloet, *Dub.* Pil. ſcill. *Lond. Dub.* Infus ſennæ, *Lond. Dub.* Syr. ſpin. cerv. *Lond.* Tinct. cinnam. comp. *Lond. Dub.* Vin. aloes, *Ed.* Acid ſulph. aromat. *Ed.*

Sp. 3. AMOMUM ZEDOARIA. *Radix.* (*Dub.*)

Long Zedoary. The root.

THE Zedoary is perennial, and grows in Ceylon and Malabar. The roots come to us in pieces, ſome inches in length, and about a finger thick. Externally they are wrinkled, and of an aſh-grey colour, but internally are browniſh red. The beſt kind comes from Ceylon, and ſhould be firm, heavy, of a dark colour within, and neither worm-eaten nor very fibrous. It has an agreeably fragrant ſmell, and a warm, bitteriſh, aromatic taſte.

In diſtillation with water, it yields an eſſential oil, heavier than water, poſſeſſing the ſmell and flavour of the zedoary in an eminent degree; the remaining decoction is almoſt ſimply bitter. Spirit likewiſe brings over ſome ſmall ſhare of its flavour: nevertheleſs the ſpiritous extract is conſiderably more grateful than the zedoary itſelf. From 7680 parts Neumann got 2720 of watery extract, and afterwards 140 of almoſt inſipid reſin; by applying alcohol firſt, 720, and water afterwards, 2400 much bitterer than the original watery extract.

Off. prep. Confect. aromat. *Lond.*

Sp. 7. AMOMUM CARDAMOMUM.

Sp. 10. ——— REPENS. *Semen.* (*Ed.*)

Cardamomum minus. Semina. (*Dub. Lond.*)

Leſſer cardamom ſeeds.

THE London and Edinburgh Colleges, on the authority of Sonnerat, have ſuppoſed theſe ſeeds to be the product of the latter ſpecies, while the Dublin College, with Murray, Willdenow, and all the foreign pharmaceutical writers, aſcribe them to the former. Both ſpecies are natives of India.

Cardamom ſeeds are a very warm, grateful, pungent aromatic, and frequently employed as ſuch in practice: they are ſaid to have this advantage, that notwithſtanding their pungency, they do not, like thoſe of the pepper kind, immoderately heat or inflame the bowels. Both water and rectified ſpirit extract their virtues by infuſion, and elevate them in diſtillation; with this difference, that the tincture and diſtilled ſpirit are conſiderably more grateful than the infuſion and diſtilled water: the watery infuſion appears turbid and mucilaginous; the tincture limpid and tranſparent. From 480 parts Neumann got about 20 of volatile oil, 15 of reſinous extract, and 45 of watery. The huſks of the ſeeds, which have very little ſmell or taſte, may be commodiouſly ſeparated, by committing the whole to the mortar, when the ſeeds will readily pulverize, ſo as to be freed from the ſhell by the ſieve: this ſhould not be done till juſt before uſing them; for if kept without the huſks, they ſoon loſe conſiderably of their flavour.

Off. prep. Tinctura, *Ed. Lond. Dub.* Tinct. comp. *Lond. Dub.* Tinct. ſennæ, *Lond. Dub.* Tinct. gent. comp. *Lond.* Tinct. cinnam. comp. *Ed. Lond. Dub.* Tinct. rhei, *Ed. Lond.* Tinct. rhei cum aloe, *Ed.* Vin. aloes, *Ed.* Vin. rhab. *Lond.* Extr. coloc. comp. *Lond.* Pulv. arom. *Ed. Lond. Dub.* Confect. aromat. *Lond.* Pil. ſcill. *Ed.*

AMYGDALUS COMMUNIS. *Nucleus.* (*Ed.*)

a. *Amygdalus dulcis.* (*Ed.*) *Amygdalæ dulces.* (*Lond. Dub.*)
b. *Amygdalæ amaræ.* (*Lond.*)

The almond tree. The kernel of the fruit.

Willd. g. 981. *ſp.* 2. *Icoſandria Monogynia.*—Nat. ord. *Pomaceæ.*

THE fruit which affords theſe kernels, is the produce of a tree nearly reſembling the peach. It originally came from Syria and Barbary; but is now much cultivated in the ſouth of Europe.

The eye diſtinguiſhes no difference betwixt the trees which produce the ſweet and bitter, or betwixt the kernels themſelves; it is ſaid that the ſame tree has, by a difference in culture, afforded both.

The almond is a flattiſh kernel, of a white colour, and of a ſoft ſweet taſte, or a diſagreeable bitter one. The ſkins of both ſorts are thin, browniſh, unpleaſant, and covered with an acrid powdery ſubſtance. They are very apt to become rancid on keeping, and to be preyed on by a kind of inſect, which eats out the internal part, leaving the almond to appearance entire. To theſe circumſtances regard ought to be had in the choice of them.

Sweet almonds are of greater uſe in food than as medicine, but they are reckoned to afford little nouriſhment; and when eaten in ſubſtance, are not eaſy of digeſtion, unleſs thoroughly comminuted. They are ſuppoſed, on account of their unctuous quality, to obtund acrimonious juices in the primæ viæ: peeled ſweet almonds, eaten ſix or eight at a time, ſometimes give preſent relief in the heartburn.

Bitter almonds have been found poiſonous to dogs and ſome other animals; and a water diſtilled from them, when made of a certain degree of ſtrength, has had the ſame effects. Nevertheleſs, when eaten, they appear innocent to moſt men, and are every day uſed in cookery on account of their agreeable flavour, but there are ſome habits in which the ſmalleſt quantity produces urticaria, and other unpleaſant ſymptoms. The ſimilarity of the ſmell of bitter almonds to pruſſic acid led Mr. Schrader to ſuppoſe, that it was owing to the preſence of this acid, and it is ſaid that he has found his ſuppoſition correct, and that pruſſic acid is equally poiſonous with the bitter diſtilled waters.

Both ſorts of almonds yield, on expreſſion, a large quantity of oil, which ſeparates likewiſe upon boiling the almonds in water, and is gradually collected on the ſurface.

. The oils obtained by expreſſion from both ſorts of almonds are in their ſenſible qualities the ſame. They ſhould be perfectly free from ſmell and taſte, and poſſeſs the other properties of fixed oils.

Medical uſe.—The general virtues of theſe oils are, to blunt acrimonious humours, and to ſoften and relax the ſolids: hence their uſe internally, in tickling coughs, heat of urine, pains and inflammations; and externally, in tenſion and rigidity of particular parts. On triturating almonds with water, the oil and water unite together, by the mediation of the other matter of the kernel, and form an unctuous milky liquor.

The milky ſolutions of almonds in watery liquors, commonly called emulſions, contain the oil of the ſubject, and participate in ſome degree of its emollient virtue; but have this advantage above the pure oil, that they may be given in acute or inflammatory diſorders, without danger of the ill effects which the oil might ſometimes produce; ſince emulſions do not turn rancid or acrimonious by heat, as all the oils of this kind in a little time do. As the bitter almond imparts its peculiar taſte when treated in this way, the ſweet almonds are employed in making emulſions.

Several unctuous and reſinous ſubſtances, of themſelves not miſcible with water, may, by trituration with almonds, be eaſily mixed with it into the form of an emulſion; and are thus excellently fitted for medicinal uſe. In this form, camphor, and the reſinous purgatives may be commodiouſly taken.

Off. prep. Oleum fixum, *Ed. Lond. Dub.* Emulſio, *Ed. Lond. Dub.* Emulſio Arab. *Ed. Dub.* Emulſio camph. *Ed. Lond.*

AMYLUM *ex tritico præparatum.*

Wheat ſtarch.

The Edinburgh college have inſerted ſtarch as a ſeparate ſubſtance in their catalogue of the materia medica, probably conſidering it to be a general principle common to many vegetables although they point out the particular ſpecies which they wiſh to be employed.

The general properties of ſtarch have been already (255) enumerated.

Medical uſes.—As a conſtituent of many vegetable ſubſtances, it forms a moſt important alimentary ſubſtance. In a medical point of view, it is to be conſidered as a demulcent; and accordingly it forms the principal ingredient of an officinal lozenge, and a mucilage prepared from it often produces excellent effects, both taken by the mouth, and in the form of a clyſter in dyſentery and diarrhœa from irritation of the inteſtines.

Starch is found in many vegetables, combined with different ſubſtances. Fourcroy accordingly makes various ſpecies of it as combined,

1. With gluten or ſibrine, as in wheat, rye, and other ſimilar ſeeds.
2. With extractive, as in beans, peaſe, lupins, &c.
3. With mucilaginous matters, as in the potatoe and many other roots, in unripe corn.
4. With ſaccharine matter, in moſt roots, and in corn after it has begun to germinate.
5. With oil, in the emulſive ſeeds, almonds, &c.
6. With an acrid principle, as in the root of the burdock, jatropha manihot, arum, aſarum, and other tuberous roots.

Off. prep. Mucilago amyli, *Ed. Lond.* Trochiſci gummoſi, *Ed. Lond.* Pulv. trag. comp. *Lond.* Pil. hydrarg. *Ed.*

AMYRIS.

Willd. g. 755. *Octandria Monogynia.*—Nat. ord. *Dumoſæ.*

Sp. 2. AMYRIS ELEMIFERA. *Elemi. Reſina.* (*Lond. Dub.*)
Elemi. A reſin.

THE tree which furniſhes elemi grows in Carolina and Spaniſh America. In dry weather, and eſpecially at full moon, inciſions are made in the bark, from which a reſinous juice flows, and is left to harden in the ſun. It is brought to us in long roundiſh cakes, generally wrapped up in flag leaves. The beſt ſort is ſoftiſh, ſomewhat tranſparent, of a pale whitiſh yellow colour, inclining a little to green, of a ſtrong not unpleaſant ſmell, reſembling ſomewhat that of fennel. Dr. Wright ſays, that on wounding the burſera gummifera, a thick milky liquor flows, which ſoon concretes into a reſin no way different from the elemi of the ſhops. Of 100 parts 94 diſſolve in alcohol, and part of its fragrance riſes along with this menſtruum in diſtillation: diſtilled with water it yields

6.4 of pale-coloured, thin, fragrant, eſſential, oil. Its only conſtituents, therefore, are reſin and eſſential oil. It gives name to one of the officinal unguents, and is at preſent ſcarce any otherwiſe made uſe of; though it is certainly preferable for internal purpoſes to ſome others which are held in greater eſteem.

Off. prep. Ungt. elemi, *Lond. Dub.*

Sp. 18. AMYRIS ZEYLANICA.

The elemi which comes from the Eaſt Indies is ſaid to be the produce of this ſpecies.

Sp. 6. AMYRIS GILEADENSIS. *Reſina.* (*Ed.*) *Balſamum Gileadenſe.*

Balſam of Gilead. A reſin.

THIS article, which has alſo had the name of Balſamum Judaicum, Syriacum, de Mecca, Opo-balſamum, &c. is a reſinous juice, obtained from an evergreen tree, growing ſpontaneouſly, particularly near to Mecca, on the Aſiatic ſide of the Red ſea. The beſt ſort of it is a ſpontaneous exudation from the tree; and is held in ſo high eſteem by the Turks, who are in poſſeſſion of the country where it is produced, that it is rarely, if ever, to be met with genuine among us. From the high price ſet upon it, many adulterations are practiſed. The true opo-balſamum, according to Alpinus, is at firſt turbid and white, of a very ſtrong pungent ſmell, like that of turpentine, but much ſweeter; and of a bitter, acrid, aſtringent taſte: upon being kept for ſome time, it becomes thin, limpid, of a greeniſh hue, then of a gold yellow, and at length of the colour of honey.

This balſam is in high eſteem among the eaſtern nations, both as a medicine, and as an odoriferous unguent and coſmetic. It has been recommended in a variety of complaints. But in Europe it is never obtained genuine; and as all the ſigns of its goodneſs are fallacious, it has been very rarely employed. Nor need we regret it; for any of the other reſinous fluids, ſuch as the balſam of Canada or Capaiba will anſwer every purpoſe full as well.

The dried berries of this tree were formerly kept under the title of Carpo-balſamum, and the dried twigs under that of Xylo-balſamum. Although Willdenow has inſerted the amyris opo-balſamum as a diſtinct ſpecies, he thinks they are the ſame.

ANAS ANSER. *Adeps Anſerinus.* (*Dub.*)

The gooſe. The fat.

THE ſpecific properties of the different kinds of fat are now very generally diſbelieved: and therefore almoſt the only kinds iu uſe are thoſe of the domeſtic animals, which are eaſily procured.

Gooſe fat is ſoft and very greaſy. It is very rarely uſed in medicine, as it poſſeſſes no advantage over axunge.

ANCHUSA TINCTORIA. *Radix.* (*Ed.*) *Anchuſa. Radix.* (*Dub.*)

Alkanet. The root.

Willd. g. 277. *ſp.* 7. *Pentandria Monogynia.*—Nat. ord. *Aſperifoliae.*

This plant is a native of Europe: it is ſometimes cultivated in our gardens; but the greateſt quantities are raiſed in Germany or France, particularly about Montpelier, from whence the dried roots are uſually imported to us. The alkanet root produced in England is much inferior in colour to that brought from abroad; the Engliſh being only lightly reddiſh, the others of a deep purpliſh red; and it has been ſuſpected, but without ſufficient foundation, that the foreign roots owe part of their colour to art. The cortical part of the root is of a duſky red, and imparts an elegant deep red to alcohol, oils, wax, and all unctuous ſubſtances, but not to watery liquors.

Alkanet root has little or no ſmell; when recent, it has a bitteriſh aſtringent taſte; but when dried, ſcarcely any. As to its virtues, the preſent practice expects not any from it. Its chief uſe is for colouring oils, ointments, and plaſters. As the colour is confined to the cortical part, the ſmall roots are beſt, having proportionally more bark than the large.

ANETHUM.

Willd. g. 560. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

Sp. 1. Anethum Graveolens. *Semen.* (*Lond.*)

Dill. The ſeed.

Dill is an annual umbelliferous plant, cultivated in gardens, as well for culinary as medical uſe. The ſeeds are of a pale yellowiſh colour, in ſhape nearly oval, convex on one ſide, and flat on the other. Their taſte is moderately warm and pungent; their ſmell aromatic, but not of the moſt agreeable kind. Theſe ſeeds are recommended as a carminative in flatulent colics. The moſt efficacious preparations of them, are, the diſtilled oil, and a tincture or extract made with rectified ſpirit.

Off. prep. Aq. diſt. *Lond.*

Sp. 3. Anethum Foeniculum. *Radix, Semen.* (*Ed.*)

Fœniculum dulce. Semen. (*Lond. Dub.*)

Sweet fennel. The root and ſeeds.

This is a biennial plant, of which there are four varieties. One of theſe, the common fennel, is indigenous to England. The [illegible] fennel, the variety which is officinal, grows wild in Italy, but is alſo cultivated in our gardens. It is ſmaller in all its parts than the common, except the ſeeds, which are conſiderably larger. The ſeeds of the two ſorts differ likewiſe in ſhape and colour: thoſe of the common are roundiſh, oblong, flattiſh on one ſide, and protuberant on the other, of a dark almoſt blackiſh colour; thoſe of the ſweet are longer, narrower, not ſo flat, generally crooked, and of a whitiſh or pale yellowiſh colour.

The ſeeds of both the fennels have an aromatic ſmell, and a moderately warm, pungent taſte: thoſe of the *fœniculum dulce* are in flavour moſt agreeable, and have alſo a conſiderable degree of ſweetneſs.

From 960 parts, Neumann obtained 20 of volatile oil, 260 watery extract, and afterwards ſome alcoholic extract, which could not be exſiccated on account of its oilineſs. By alcohol firſt he got 84 reſinous extract, 120 fixed oil, and then by water 120 of a bitter extract.

Off. Prep. Aqua deſt. ſemin, *Lond. Dub.* Oleum volat. ſemin, *Dub.* O. v. flor. *Dub.* Decoct. cham. *Dub.*

ANGELICA ARCHANGELICA. *Radix, Folia, Semen.* (*Ed.*) *Angelica. Radix, Caulis, Folia, Semen.* (*Lond.*) *Caules, Folia, Semina.* (*Dub.*)

Angelica. The root, ſtalk, leaves, and ſeeds.

Willd. g. 543. *ſp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

Angelica is a large biennial umbelliferous plant. It grows ſpontaneouſly on the banks of rivers in Alpine countries; but for the uſe of the ſhops, it is cultivated in gardens in different parts of Europe.

All the parts of Angelica, eſpecially the roots, have a fragrant aromatic ſmell; and a pleaſant bitteriſh warm taſte, glowing upon the lips and palate for a long time after they have been chewed. The flavour of the ſeeds and leaves is very periſhable; particularly that of the latter, which, on being barely dried, loſe the greateſt part of their taſte and ſmell: the roots are more tenacious of their flavour, though they looſe part of it with keeping. The freſh root, wounded early in the ſpring, yields an odorous yellow juice; which, ſlowly exſiccated, proves an elegant gummy reſin, very rich in the virtues of the angelica. On drying the root, this juice concretes into diſtinct moleculæ, which, on cutting it longitudinally appear diſtributed in little veins; in this ſtate, they are extracted by alcohol, but not by watery liquors. Angelica roots are apt to grow mouldy, and to be preyed on by inſects, unleſs thoroughly dried, kept in a dry place, and frequently aired. We apprehend, that the roots which are ſubject to this inconvenience, might be preſerved, by dipping them in boiling ſpirit, or expoſing them to its ſteam, after they are dried. Baumé ſays that it is only the roots gathered in the ſpring that are ſubject to this inconvenience, and that when gathered in the autumn, they keep good ſeveral years. Roots only worm eaten are as fit as ever for making a tincture, or affording volatile oil.

Angelica is one of the moſt elegant aromatics of European growth, though little regarded in the preſent practice. The root, which is the moſt efficacious part is uſed in the aromatic tincture. The ſtalks make an agreeable ſweetmeat.

Off. prep. Spirit aniſi comp. *Lond.*

ANGUSTURA. *Cortex.* (*Ed. Dub.*)

THE natural hiſtory of this bark is hitherto unknown. Willdenow ſuſpects that it is the bark of the magnolia plumieri. The firſt parcel of it that was imported came from Dominica in July 1788, with an account, "that it had been found ſuperior to the "Peruvian bark in the cure of fevers." Subſequent importations from the Spaniſh Weſt Indies, either immediately or through the medium of Spain, give reaſon to ſuppoſe, that it is the produce of South America. Now that the iſland of Trinidad, from which it is commonly imported into Europe, belongs to the Engliſh, we may expect to get further information reſpecting its natural hiſtory.

Its appearance is various, owing to its having been taken from larger or ſmaller branches. The outer ſurface of it is more or leſs wrinkled, and covered with a greyiſh coat, below which it is of a yellowiſh brown: the inner ſurface is of a dull brown. It breaks ſhort and reſinous. The taſte is intenſely bitter, and ſlightly aromatic, leaving a ſtrong ſenſe of heat and pungency in the throat and fauces. The odour is peculiar. The powder is yellow.

According to the experiments related by Mr. Brande from 3840 parts of anguſtura, there were extracted by alcohol, 144 of reſin, and 300 of an acrid unctuous ſubſtance, the reſiduum yielded to water 1500 of dry gummy extract. Treated firſt with water, it gave 2110 grains of a clear brown extract, bitter, but not acrid, and afterwards 161 of a reſin of a light brown colour, and extremely acrid. By diſtillation it gave 26 of eſſential oil. The tincture is of a deep yellow colour, reddens infuſion of turnſole, and becomes turbid and white on admixture with water. By repeated filtration a browniſh reſin is ſeparated, and the tranſparent fluid has a pale yellow colour. I find that it is not precipitated by ſolution of gelatin, but by infuſion of galls. It therefore does not contain tannin but cinchonin, and it has the peculiar property of acquiring a deep red colour with red ſulphate of iron, and depoſiting a purpliſh ſlate-coloured precipitate.

As an aromatic bitter, it has been found to be a tonic and ſtimulant of the organs of digeſtion. It increaſes the appetite for food, removes flatulence and acidity, ariſing from dyſpepſia, and is a very effectual remedy in diarrhœa, from weakneſs of the bowels, and in dyſentery; and it poſſeſſes the ſingular advantage of not oppreſſing the ſtomach, as Peruvian bark is apt to do. It does not cure intermittents.

It is exhibited, 1. In powder, in dozes of from 5 to 20 grains, either alone or with rhubarb, magneſia, or carbonate of lime.

2. In infuſion. The infuſion of one drachm in four ounces of water may be uſed daily.

3. In tincture.

4. In watery extract.

ANTHEMIS.

Syngeneſia Polygamia ſuperflua.—Nat. ord. *Compoſitæ radiatæ.*

Sp. Anthemis Nobilis. *Herba et flores.* (*Ed.*)

Chamæmelum. Flores. (*Dub.*) *Flos ſimplex.* (*Lond.*)

Chamomile. The herb and flowers.

Chamomile is a perennial plant, indigenous to the ſouth of England, but cultivated in our gardens for the purpoſes of medicine. The flowers have a ſtrong, not ungrateful, aromatic ſmell, and a very bitter nauſeous taſte.

Their active conſtituents are bitter extractive, and eſſential oil. To the latter is to be abſcribed their antiſpaſmodic, carminative, cordial, and diaphoretic effects; to the former their influence in promoting digeſtion.

Neumann obtained from 480 parts, 180 of alcoholic extract, and afterwards 120 of watery; and reverſing the procedure, 240 watery, and 60 alcoholic.

Medical Uſe.—Chamomile flowers are a very common and excellent remedy, which is often uſed with advantage in ſpaſmodic diſeaſes, in hyſteria, in ſpaſmodic and flatulent colics, in ſuppreſſion of the menſtrual diſcharge, in the vomiting of puerperal women, in the after pains, in gout, in podagra, in intermittents, and in typhus.

As chamomile excites the periſtaltic motion, it is uſeful in dyſentery, but is not admiſſible in all caſes of diarrhœa. From its ſtimulating and ſomewhat unpleaſant eſſential oil, chamomile is alſo capable of exciting vomiting, eſpecially when given in warm infuſion; and in this way is often uſed to aſſiſt the action of other emetics.

Externally, chamomile flowers are applied as a diſcutient and emollient, in the form of clyſter or embrocation, in colic, dyſentery, and ſtrangulated hernia, &c.

Chamomile flowers are exhibited,

1. In ſubſtance, in the form of powder, or rather of electuary, in doſes of from half a drachm to two drachms, either alone, or combined with Peruvian bark, as for the cure of intermittent fevers.

2. In infuſion, in the form of tea. This may either be drunk warm, for promoting the action of emetics, or cold, as a ſtomachic.

3. In decoction or extract. Theſe forms contain only the extractive, and therefore may be conſidered as ſimple bitters.

4. The eſſential oil may be obtained by diſtillation. This poſſeſſes the antiſpaſmodic powers in a higher degree than the ſimple flowers, but on the contrary, does not poſſeſs the virtues depending on the preſence of the bitter extractive.

Off. prep. Decoct. *Ed. Lond. Dub.* Extract, *Lond. Ed. Dub.*

Sp. ANTHEMIS PYRETHRUM. *Radix.* (*Ed.*)
Pyrethrum. Radix. (*Lond. Dub.*)
Pellitory of Spain. The root.

THIS plant, though a native of warm climates, as Barbary, bears the ordinary winters of this country, and often flowers ſucceſſively from Chriſtmas to May: the roots alſo grow larger with us than thoſe with which the ſhops are uſually ſupplied from abroad. They are ſeldom ſo big as the little finger, and the beſt are dry, compact, of a brown colour, and not eaſily cut with a knife.

Pellitory root has no ſenſible ſmell; its taſte is very hot and acrid, but leſs ſo than that of arum; the juice expreſſed from it has ſcarce any acrimony, nor is the root itſelf ſo pungent when freſh as after it has been dried. Neumann obtained from 960 parts of the dry root only 40 of alcoholic extract, and afterwards 570 of watery, and by a reverſe procedure, 600 of watery, and 20 of alcoholic extract. Both the alcoholic extracts were exceſſively pungent. Its acrimony, therefore, is derived from a reſin.

Medical Uſe.—The principal uſe of pyrethrum in the preſent practice is as a maſticatory, for promoting the ſalival flux, and evacuating the viſcid humours from the head and neighbouring parts; by this means it often relieves the toothach, ſome kinds of pains of the head, and lethargic complaints. A vinous infuſion is alſo uſeful in debility of the tongue.

ANTIMONIUM. *Stibium.*
Antimony.

The phyſical and chemical properties of this metal have been already deſcribed.

Antimony is found,

- I. In its metallic ſtate, at Sahlberg in Sweden, and Allemont in France.
- II. Mineralized with ſulphur.
  - 1. Grey antimony.
    - *a.* Compact.
    - *b.* Foliated.
    - *c.* Striated (74 antimony, 29 ſulphur, Bergmann).
    - *d.* Plumoſe (ſulphuret of antimony with arſenic and iron, Berg.)
  - 2. Red antimony (hydroguretted ſulphuret of antimony).
- III. Oxidized. Mongez.
- IV. Acidified.
  - 1. Muriated.
  - 2. Phoſphated. Yellow ore of antimony, Razumouſky.

The grey ore of antimony is the ſtate in which it is officinal, and alſo that in which it is moſt commonly found.

SULPHURETUM ANTIMONII. (*Ed.*) *Antimonium.* (*Lond.*) *Stibium.* (*Dub.*)

Sulphuret of Antimony.

Whatever opinion may be formed of the nomenclature adopted by the Edinburgh college in general, the propriety of the change which they have introduced in this and ſimilar inſtances cannot be diſputed: for while chemiſts, according to rational principles, deſignated ſimple ſubſtances by ſimple names, the ſame names continued to be given by pharmaceutical writers to compound ſtates of theſe bodies. To have eſtabliſhed, therefore, an uniformity of nomenclature in ſciences ſo intimately allied, cannot fail to be conſidered as an improvement of the greateſt importance.

Although ſulphuretted antimony be a natural production, yet it is commonly ſold in the form of loaves, which have been ſeparated from the ſtony, and other impurities of the ore by fuſion, and a ſpecies of filtration. For the ore is melted in conical well-baked earthen pots, having one or more ſmall holes in their apices. The fire is applied around and above theſe pots; and as ſoon as the ſulphuretted antimony melts, it drops through the holes into veſſels placed beneath to receive it, while the ſtony and other impurities remain behind. As antimony is very volatile, the mouths and joinings of the pots muſt be cloſed and luted. The upper part of the loaves thus obtained is more ſpongy, lighter, and impure than the lower, which is therefore always to be preferred.

Theſe loaves have a dark grey colour externally, but on being broken, they appear to be compoſed of radiated ſtriæ, of a metallic luſtre, having the colour of lead. The goodneſs of the loaves is eſtimated from their compactneſs and weight, from the largeneſs and diſtinctneſs of the ſtriæ, and from their being entirely vaporizable by heat. Lead has been ſold for antimony; but its texture is rather foliated than ſtriated, and it is not vaporizable. The preſence of arſenic, which renders the antimony uſeleſs for medical purpoſes, is known by its emitting the ſmell of garlic when thrown upon live coals, and by other teſts mentioned under arſenic. The preſence of manganeſe or iron is known by their not being volatilized by a red heat.

Antimony is obtained from its ores by gradually detonating in a large crucible four parts of ſulphuretted antimony, three of crude tartar, and one and a half of dry nitrate of potaſs; reduced to a fine powder, and intimately mixed. The detonated maſs is then to be fuſed and poured into a heated mould, greaſed with a little fat, in which it is allowed to conſolidate. It is then turned out, and the ſcoriæ are ſeparated from the antimony, which will weigh about one fourth part of the ſulphuret employed. The ſcoriæ are a mixture of ſulphuret of potaſs and of antimony, and may be preſerved for other purpoſes.

Another method of obtaining antimony, is by melting three parts of ſulphuretted antimony with one of iron. The ſulphur quits the antimony, and combines with the iron.

Formerly antimony was given internally; but as its action depended entirely on the acid it met with in the ſtomach, its effects were very uncertain, and often violent. Cups were alſo made of antimony, which imparted to wine that ſtood in them for ſome time an emetic quality. But both theſe improper exhibitions of this metal are now laid aſide.

Med. uſe.—Sulphuretted antimony was employed by the ancients in collyria againſt inflammations of the eyes; and for ſtaining the eyebrows black. Its internal uſe does not ſeem to have been eſtabliſhed till towards the end of the fifteenth century; and even at that time it was by many looked upon as poiſonous. But experience has now fully evinced, that has no noxious quality, being often uſed, particularly in chronic eruptions; that ſome of the preparations of it are medicines of great efficacy; and that though many of them are moſt violently emetic and cathartic, yet even theſe, by a ſlight alteration or addition, loſe their virulence, and become mild in their operation.

Off. prep.—Antimony is at preſent the baſis of many officinal preparations, to be afterwards mentioned. But beſides thoſe ſtill retained, many others have been formerly in uſe, and are ſtill employed by different practitioners. The following table, drawn up by Dr. Black, exhibits a diſtinct view of the whole.

Dr. BLACK's TABLE of the PREPARATIONS of ANTIMONY.

Medicines are prepared either from crude antimony, or from the pure metallic part of it, called regulus.

From CRUDE ANTIMONY.

I. By trituration.
Antimonium præparatum. Lond.

II. By the action of heat and air.
Flores antimonii ſine addito.
Vitrum antimonii. Ed.
Antimonium vitrificatum. Lond.
Vitrum antimonii ceratum. Ed.

III. By the action of alkalies.
Hepar antimonii mitiſſimum
Regulus antimonii medicinalis.
Hepar ad kermes minerale. *Geoffroi.*
Hepar ad tinct. antimonii.
Kermes minerale.
Sulphur antimonii præcipitatum. Ed. et Lond.

IV. By the action of nitre.
Crocus antim. mitiſſimus, *vulgo, Regulus antim. medicinalis.*
Crocus antimonii. Ed. et Lond.
Antimonii emeticum mitius. Boerh.
Antim. uſtum cum nitro, *vulgo,* Calx antimonii nitrata. Ed.
Antimonium calcinatum. Lond. *vulgo, Antimonium diaphoret.*
Antim. calcareo-phoſphoratum, ſive pulvis antimonialis. Ed.
Pulvis antimonialis. Lond.

V. By the action of acids.
Antim. vitriolat. Klaunig.
Antim. cathartic. Wilſon.
Antimonium muriatum, *vulgo,* Butyrum antim. Ed.
Antimonium muriatum. Lond.
Pulvis algarothi, ſive *Mercurius Vitæ.*
Bezoardicum minerale.
Antimonium tartariſatum, *vulgo,* Tartarus emeticus. Ed.
Antimonium tartariſatum. Lond.

Vinum antimonii tartariſati. Ed. et Lond.
Vinum antimonii. Lond.

From the REGULUS.

This metal, ſeparated from the ſulphur by different proceſſes, is called *Regulus antimonii ſimplex*, *Regulus martialis*, *Regulus jovialis*, &c. From it were prepared,

I. By the action of heat and air,
Flores argentei, ſive nix antim.

II. By the action of nitre,
Ceruſſa antimonii.
Stomachicum Poterii.
Antihecticum Poterii.
Cardiacum Poterii.

PREPARATIONS which have their name from ANTIMONY, but ſcarcely contain any of it.

Cinnabaris antimonii.
Tinctura antimonii.

To this table of Dr Black's, which is left unaltered, I ſhall add another, not taken from the mode of preparation, but from the nature of the product.

ANTIMONY has been exhibited,

- I. In its metallic ſtate.
  - *a.* Antimonium. Regulus antimonii.
  - *b.* Alloyed,
    - 1. With iron. Regulus antimonii martialis.
    - 2. With tin. Regulus antimonii jovialis.
    - 3. With tin and copper. Regulus metallorum.
  - *c.* Combined with ſulphur.
    - 1. Sulphuretum antimonii. (Ed.) Antimonium. (Lond.) Stibium. (Dub.) Sulph. ant. ppt. E. L. D.
    - 2. Regulus antimonii medicinalis. (Mact.) Febrifugum Craanii.
- II. Oxidized,
  - *a.* Protoxide.
    - 1. Calx antimonii *per ſe.* Cinis antimonii.

L

2. Flores antimonii argentini.
3. Calx ſtibii præcip. D. Pulvis algarothi.
4. Combined with ſulphuret of antimony. Oxidum antimonii cum ſulphure vitrificatum, E.

Antim. vitrif. L. Vitrum antimonii. *Melted with wax.* Oxidum antimonii vitrif. cum cera, E.

Oxidum antimonii cum ſulph. per nitrat potaſſæ, E. Stibium nitro calin. at D. Crocus antimonii. Crocus metallorum. Hepar antim.

5. Combined with ſulphuretted hydrogen. Sulphuret. ant. præcip. E. Sulph. ant. præcip. L. Sulph. ſtibias rufam, D. Sulphur auratum antimonii.
6. With hydroguretted ſulphur. Sulphur ſtibiat fuſcum D. Kermes minerale.
7. With muriatic acid. Murias antim. E. Ant. mur. L. Stib. muriat. cauſt. D. Butyrum antimonii.
8. With tartaric acid and potaſs. Tartris antimonii, E. Ant. Tart. L. Tart. ſtibiat, D. Tartarus emeticus. *Diſſolved in wine.* Vinum tart. ant. E. Vin. tart. ſtib. D. Vin. ant. tart. L. Vin. ant. L. Vinum antimoniale.
9. With phoſphate of lime. Oxidum antimonii cum phoſphate calcis, E. Pulv. ant. L. Pulv. ſtib. D. James's powders.

b. Peroxide.

Antimonium calcinatum. Lond.

Theſe are the principal preparations of antimony. In eſtimating their comparative value, we may attend to the following obſervations. All the metallic preparations are uncertain, as it entirely depends on the ſtate of the ſtomach, whether they have no action at all, or operate with dangerous violence. The ſulphuret is expoſed, though in a leſs degree, to the ſame objections.

The preparations in which antimony is in the ſtate of peroxide, are perfectly inſoluble in any vegetable or animal acid, and are alſo found to be perfectly inert when taken into the ſtomach.

The remaining preparations of antimony, or thoſe in which it is in the ſtate of protoxide, are readily ſoluble in the juices of the ſtomach, and act in very minute doſes. Of its ſaline preparations, only thoſe can be uſed internally which contain a vegetable acid; for its ſoluble combinations with the ſimple acids are very acrid and corroſive. In general, the ſureſt and beſt preparations of antimony are thoſe which contain a known quantity of the metal in its ſtate of protoxide.

The general effects of antimonials are, in ſmall doſes, diaphoreſis, nauſea: in large doſes, full vomiting and purging. Some allege that antimonials are of moſt uſe in fevers when they do not produce any ſenſible evacuation, as is ſaid to be the caſe ſometimes with James's powder. They therefore prefer it in typhus, and emetic tartar in ſynochus, in which there is the appearance at firſt of more activity in the ſyſtem, and more apparent cauſe for evacuation.

APIUM PETROSELINUM. *Radix.* (*Ed.*)
Petroſelinum. Radix, Semen. (*Lond.*)
Parſley. The root. (*Ed.*) The root and ſeed. (*Lond.*)
Willd. g. 563. *ſp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

Parsley is a biennial plant, and a native of the South of Europe. It is very generally cultivated in this country for culinary purpoſes. The ſeeds have an aromatic flavour, and are occaſionally made uſe of as carminatives. The taſte of the root is ſomewhat ſweetiſh, with a light degree of warmth and aromatic flavour, and it poſſeſſes gentle diuretic properties.

AQUA.
Water.

Water does not enter the liſt of materia medica of any of the colleges, but it is ſo important an agent both in the cure of diſeaſe, and in the practice of pharmacy, that a brief account of its varieties and properties can ſcarcely be conſidered as ſuperfluous.

The chemical properties of water have been already enumerated. The pureſt natural water is ſnow, or rain, water, collected in the open fields; that which falls in towns, or is collected from the roofs of houſes, is contaminated with ſoot, animal effluvia, and other impurities, although after it has rained for ſome time, the quantity of theſe diminiſhes ſo much, that Morveau ſays that it may be rendered almoſt perfectly pure by means of a little barytic water, and expoſure to the atmoſphere. Rain water, after it falls, either remains on the ſurface of the earth, or penetrates through it until it meet with ſome impenetrable obſtruction to its progreſs, when it burſts out at ſome lower part, forming a ſpring or well. The water on the ſurface of the earth either deſcends along its declivities in ſtreams, which gradually wearing channels for themſelves, combine to form rivers, which at laſt reach the ſea or remain ſtagnant in cavities of conſiderable depth, forming lakes or ponds, or on nearly level ground forming marſhes.

The varieties of ſpring water are exceedingly numerous; but they may be divided into the ſoft, which are ſufficiently pure to diſſolve ſoap, and to anſwer the purpoſes of pure water in general; the hard, which contain earthy ſalts and decompoſe ſoap, and are unfit for many other purpoſes both in domeſtic economy and in manufactures; and the ſaline, which are ſtrongly impregnated with ſoluble ſalts. When ſpring waters poſſeſſes any peculiar character, they are called mineral waters. River water is in general ſoft, as it is formed of ſpring water, which by expoſure becomes more pure; and running ſurface water, which although turbid from particles of clay ſuſpended in it, is otherwiſe very pure. Lake water is ſimilar to river water. The water of marſhes on the contrary is exceeding impure, and often highly fetid, from the great proportion of animal and vegetable matters which is conſtantly decaying in them.

Mineral waters derive their peculiarity of character in general, either from containing carbonic acid, or ſoda, not neutralized, ſulphuretted hydrogen, purging ſalts, earthy ſalts, or iron, or from their temperature exceeding in a greater or leſs degree that of other ſurrounding bodies. The following are the moſt celebrated;

a. Warm ſprings.—Bath, Briſtol, Buxton, Matlock, in England. Barege, Vichy, &c. in France. Aix-la-Chapelle, Borſet, Baden, Carlſbad, and Toeplitz, in Germany; and Piſa, Lucca, Baia, and many others in Italy.
b. Carbonated ſprings.—Pyrmont, Seltzer, Spa, Cheltenham, Scarborough.
c. Alkaline.—Carlſbad, Aix-la-Chapelle, Barege, Toeplitz.
d. Sulphureous.—Enghien, Lu, Aix-la-Chapelle, Kilburn, Harrowgate, Moffat, and many in Italy.
e. Purging.—Sea water, Lemington Priors, Harrowgate, Lu, Carlſbad, Moffat, Toeplitz, Epſom, Sedlitz, Kilburn, and all brackiſh waters.
f. Calcareous.—Matlock, Buxton, and all hard waters.
g. Chalybeate.—Hartfell, Denmark, Cheltenham, Pyrmont, Spa, Tunbridge, Bath, Scarborough, Vichy, Carlſbad, Lemington Priors.

Medical uſe. Water is an eſſential conſtituent in the organization of all living bodies; and as it is continually expended during the proceſs of life, that waſte muſt be alſo continually ſupplied, and this ſupply is of ſuch importance that it is not left to reaſon or to chance, but forms the object of an imperious appetite. When taken into the ſtomach, water acts by its temperature, its bulk, and the quantity abſorbed by the lacteals. Water about 60° gives no ſenſation of heat or cold, between 60° and 45° it gives a ſenſation of cold followed by a glow and encreaſe of appetite and vigour, below 45 the ſenſation of cold is permanent and unpleaſant, and it acts as an aſtringent and ſedative; above 60 it excites nauſea and vomiting, probably by partially relaxing the fibres of the ſtomach, for when mixed with ſtimulating ſubſtances it has not theſe effects. In the ſtomach and the inteſtines it acts alſo by its bulk, producing the effects ariſing from the diſtention of theſe organs, and as the inteſtinal gaſes conſiſt of hydrogen gas, either pure or carbonated, or ſulphuretted, or phoſphuretted, it is probably in part decompoſed in them. It likewiſe dilutes the contents of the ſtomach and inteſtines, thus often diminiſhing their acrimony. It is abſorbed by the lacteals, dilutes the chyle and the blood, encreaſes their fluidity, leſſens their acrimony, and produces plethora ad molem. Its effects in producing plethora and fluidity are however very tranſitory, as it at the ſame time increaſes the ſecretion by the ſkin and kidneys. Indeed the effects of ſudorifics and diuretics depend in a great meaſure on the quantity of water taken along with them.

Mineral waters have alſo a ſpecific action depending on the foreign ſubſtances which they contain. It is however neceſſary to remark that their effects are in general much greater than might be expected from the ſtrength of their impregnations, owing probably to the very circumſtance of their great dilution, by which every particle is preſented in a ſtate of activity, while the lacteals admit them more readily than they would in a leſs diluted ſtate.

Carbonic acid gas gives to the waters which are ſtrongly impregnated with it a ſparkling appearance, and an agreeable degree of pungency. In its effects on the body it is decidedly ſtimulant, and even capable of producing a certain degree of tranſient intoxication. It is of great ſervice in bilious complaints, atony of the ſtomach, nauſea, and vomiting, and in all fevers of the typhoid type.

Alkaline waters produce alſo a tonic effect on the ſtomach, but they are leſs grateful. They are particularly ſerviceable in morbid acidity of the ſtomach, and in diſeaſes of the urinary organs.

Sulphureous waters are chiefly uſed in cutaneous and glandular diſeaſes. Their effects are ſtimulant and heating, and they operate by the ſkin or bowels.

Purging waters derive their effects from the neutral ſalts they contain, eſpecially the muriates of ſoda, lime and magneſia, and the ſulphates of ſoda and magneſia. They are much more frequently uſed for a length of time to keep the bowels open by exciting the natural action, than to produce full purging. Uſed in this way, inſtead of debilitating the patient, they encreaſe his appetite, health, and ſtrength.

Chalybeate waters are uſed as tonics. They ſtimulate conſiderably, and increaſe the circulation, but as they alſo generally contain neutral ſalts, they act as gentle laxatives. They are uſed in all caſes of debility, cachexia, chloroſis, fluor albus, amenorrhœa, and in general in what are called nervous diſeaſes.

The external uſe of water depends almoſt entirely on its temperature, which may be

1. Greater than that of the body, or above 97° F. The hot bath.

2. Below the temperature of the body.
   - *a.* From 97 to 85, the warm bath.
   - *b.* From 85 to 65, the tepid bath.
   - *c.* From 65 to 32, the cold bath.

The hot bath is decidedly ſtimulant in its action. It renders the pulſe frequent, the veins tingid, the ſkin red, the face fluſhed, the reſpiration quick, increaſes animal heat, and produces ſweat. If the temperature be very high, the face becomes bathed in ſweat, the arteries at the neck and temples beat with violence, anxiety and a ſenſe of ſuffocation are induced, and if perſiſted in, vertigo, throbbing in the head, and apoplexy, are the conſequences. It is very rarely employed in medicine, except where there are hot ſprings, as at Baden in Switzerland. The Ruſſians and ſome other nations uſe the hot bath as an article of luxury.

The effects of the affuſion of hot water have not been decided, and it probable that when the heat is not ſo great as to deſtroy the organization of the ſkin, the very tranſient application of the water would be more than counteracted by the ſubſequent evaporation.

With regard to the action ariſing from their temperature, all baths below 97° differ only in degree, as they all ultimately abſtract caloric from the ſurface, but with a force inverſely as their temperature.

The warm bath excites the ſenſation of warmth, partly becauſe our ſenſations are merely relative, and partly becauſe its temperature, though leſs than that of the internal parts of the body, is actually greater than that of the extremities which are the chief organs of touch. But as water is a much better conductor of caloric than air, and eſpecially than confined air, as much caloric is abſtracted from the body by water, which is only a few degrees lower than the internal temperature of the body, as by air of a much lower temperature. The warm bath diminiſhes the frequency of the pulſe, eſpecially when it has been previouſly greater than natural, and this effect is always in proportion to the time of immerſion. It alſo renders the reſpiration ſlower and leſſens the temperature of the body, relaxes the muſcular fibre, increaſes the bulk of the fluids by abſorption, removes impurities from the ſurface, promotes the diſquamation and renewal of the cuticle, and ſoftens the nails and indurations of the ſkin.

The ſtimulant power of the warm bath is therefore very inconſiderable, and its employment in diſeaſe will be chiefly indicated by preternatural heat of the ſurface and frequency of the pulſe, rigidity of the muſcular fibre, and morbid affections of the ſkin, It has accordingly been found ſerviceable in many caſes of pyrexia, both febrile and exanthematous, in many ſpaſmodic diſeaſes, and in moſt of the impetigines. It is contraindicated by difficulty of breathing, and internal organic affections, and ſhould not be uſed when the ſtomach is full.

The affuſion of warm water very generally produces a conſiderable diminution of heat, a diminiſhed frequency of pulſe and reſpiration, and a tendency to repoſe and ſleep; but its effects are not very permanent, and its ſtimulus is weak. It is recommended in febrile diſeaſes depending on the ſtimulus of preternatural heat, and in thoſe attended with laborious reſpiration, and in the paroxyſms of hectic fever.

As the tepid bath and affuſſion produce effects intermediate between thoſe of warm and cold water, it is unneceſſary to enumerate them.

The cold bath produces the ſenſation of cold, which gradually ceaſes, and is ſucceeded by numbneſs. It excites tremors in the ſkin, and ſhivering. The ſkin becomes pale, contracted, and acquires the appearance termed cutis anſerina. The fluids are diminiſhed in volume; the ſolids are contracted, the caliber of the veſſels is leſſened, and therefore numbneſs and paleneſs are induced, and the viſible cutaneous veins become ſmaller. There is a ſenſe of drowſineſs and inactivity, the joints become rigid and inflexible, and the limbs are affected with pains and ſpaſmodic contractions. The reſpiration is rendered quick and irregular; the pulſe ſlow, firm, regular, and ſmall; the internal heat is at firſt diminiſhed, but gradually and irregularly returns nearly to its natural ſtandard, the extremities, however, continue cold and numb, or ſwollen and livid; the perſpiration is ſuppreſſed, and the diſcharge of urine is rendered more frequent and copious. If the cold be exceſſive on its application, long continued violent ſhiverings are induced, the pulſe ceaſes at the wriſt, the motion of the heart becomes feeble and languid, there is a ſenſation of coldneſs and faintneſs at the ſtomach, and a rapid diminution of animal heat; and at laſt delirium, torpor, and death, are the conſequences. If the application of the cold bath be not carried to an exceſſive length, on emerging from the water, the whole body is pervaded by an agreeable ſenſation of warmth, and the patient feels refreſhed and invigorated.

The primary action of the cold bath is ſtimulant, and the degree of this action is in proportion to the lowneſs of its temperature. This opinion is indeed directly oppoſite to a theory of cold which has been advanced with the confidence of demonſtration. "Heat "is a ſtimulus; cold is the abſtraction of heat; therefore cold is "the abſtraction of ſtimulus, or is a ſedative." To this we might oppoſe another theory, equally ſyllogiſtic, and nearer the truth; Free caloric is a ſtimulus, cold is the ſenſation excited by the paſſage of free caloric out of the body, therefore, cold is a ſtimulus. But in fact the action of cold is by no means ſo ſimple, but is complicated, and varies according to its intenſity, duration, and the ſtate of the ſyſtem to which it is applied. It acts, at firſt, as a ſtimulant in exciting ſenſation, then as a tonic in condenſing the living fibre, and laſtly, however paradoxical it may appear, as a ſedative, by preventing that diſtribution of blood in the minute and ultimate veſſels, which is neceſſary for the exiſtence of ſenſibility and irritability.

The cold bath may be therefore ſo managed as to procure any of theſe effects, by regulating the length of time for which it is applied. It may be employed in fevers, and febrile paroxyſms, when the heat is ſteadily above the natural ſtandard, and in many diſeaſes ariſing from relaxation and debility. It is contraindicated when the heat of the body is below 97°, when there is any notable perſpiration from the ſurface, when there is general plethora, and when any internal organ is diſeaſed. Irritable habits ſhould be defended from the violence of its action, by covering the body with flannel.

Cold affuſion, or the pouring of cold water over the body, is a a very convenient way of applying the cold bath in many caſes. In this way cold is very ſuddenly applied to the ſurface, its operation is inſtantaneous and momentary, but may be continued by repeated affuſions for any length of time, and ſo as to produce its extreme effects. Where the effects of cold affuſion may be thought too ſevere, ſpunging the body with cold water, or water and vinegar may be ſubſtituted.

Pharm. prep.—Aqua diſtillata. *Ed. Lond. Dub.* It alſo enters into the compoſition of the greateſt number of preparations.

ARBUTUS UVA URSI. *Folia.* (*Ed.*) *Uva Urſ. Folia.* (*Lond. Dub.*)

Whortleberry. The leaves.

Willd. g. 871. *ſp.* 7.—*Decandria Monogynia.*—Nat. ord. *Bicornes.*

THIS is a very ſmall evergreen ſhrub. The leaves are oval, not toothed, and their under ſurface is ſmooth and pale green. They grow wild in the woods, and on ſand hills in Scotland, and in almoſt every country in Europe. Their taſte is aſtringent, followed by bitterneſs. Digeſted in alcohol they give out a green tincture, which is rendered turbid by water, and when filtered, paſſes tranſparent and yellow, while a green reſin remains on the filter. They are powerfully aſtringent, approaching in the deepneſs of the colour which they give to red ſulphate of iron, more nearly to nutgalls than any ſubſtance I have tried. Indeed in ſome parts of Ruſſia they are uſed for tanning.

Medical uſe.—The medical effects of this medicine depend entirely on its aſtringent and tonic powers. It is therefore uſeful in various fluxes ariſing from debility, menorrhagia, fluor albus, cyſtirrhœa, diabetes, enureſis, diarrhœa, dyſentery, &c. It has been ſtrongly recommended in diſeaſes of the urinary organs by De Haen, particularly in ulcerations of the kidnies and bladder. It certainly alleviates the dyſpeptic ſymptoms accompanying nephritic complaints. It is commonly given in the form of powder, in doſes of from 20 to 60 grains, three or four times a day.

ARCTIUM LAPPA. *Radix.* (*Ed.*) *Bardana.* *Radix.* (*Lond.* *Dub.*)

Burdock. The root.

Syngeneſia Polygamia æqualis.—Nat. ord. *Compoſitæ Capitatæ.*

THIS is a perennial plant, which grows wild in uncultivated places. The ſeeds have a bitteriſh ſubacrid taſte: they are recommended as very efficacious diuretics, given either in the form of emulſion, or in powder, to the quantity of a drachm. The roots taſte ſweetiſh, with a light auſterity and bitteriſhneſs: they are eſteemed aperient, diuretic, and ſudorific; and are ſaid to act without irritation, ſo as to be ſafely ventured upon in acute diſorders. Decoctions of them have of late been uſed in rheumatic, gouty, venereal, and other diſorders: and are preferred by ſome to thoſe of ſarſaparilla.

ARGENTUM. (*Ed. Lond.*) *Argentum in laminas extenſum.* (*Dub.*)

Silver. Silver leaf.

THE chemical and phyſical properties of ſilver have been already enumerated.

Silver is found,

I. In its metallic ſtate;
  1. Pure.
  2. Alloyed with gold. Auriferous ſilver ore.
  3. ———— antimony.
  4. ———— iron and arſenic.
  5. ———— biſmuth.

II. Combined with ſulphur:
  1. Sulphuretted ſilver. Vitreous ſilver ore.
  2. ———————— with antimony, iron, arſenic, and copper. Black or brittle ſilver ore.
  3. ———————— with copper and antimony. Black ſilver ore.

4. Sulphuretted ſilver with lead and antimony. White ſilver ore.

III. Oxidized :
  1. Combined with carbonic acid and antimony.
  2. ——————— muriatic acid.
    a. Corneous ſilver ore.
    b. Earthy ſilver ore.
    c. Sooty ſilver ore.
  3. Combined with ſulphur and oxide of antimony. Red ſilver ore.
  4. ——————— molybdic acid.

Off. Prep. Nitras argenti, *Ed. Lond. Dub.*

ARISTOLOCHIA SERPENTARIA. *Radix.* (*Ed.*)
Serpentaria Virginiana. Radix. (*Lond. Dub.*)
Virginian Snake-root. The root.
Gynandria Hexandria.—Nat. ord. *Sarmentoſæ.*

THIS is a ſmall, light, buſhy root, conſiſting of a number of ſtrings or fibres matted together, iſſuing from one common head; of a browniſh colour on the outſide, and paler or yellowiſh within. It has an aromatic ſmell, like that of valerian, but more agreeable; and a warm, bitteriſh, pungent taſte, very much reſembling that of camphor. I find that treated with alcohol it affords a bright green tincture, which is rendered turbid by water; by filtration a ſmall portion of a green matter is ſeparated, but its tranſparency is not reſtored. It neither precipitates tannin or gelatin, nor affects the ſalts of iron or tincture of turnſole. When the diluted tincture is diſtilled, the ſpirit and tincture paſs over milky, ſtrongly impregnated with its peculiar flavour.

Medical uſe.—Its virtues are principally owing to the eſſential oil with which it abounds. Its general action is heating and ſtimulant; its particular effects, to promote the diſcharge by the ſkin and urine. In its effects it therefore coincides with camphor, but ſeems to be a more permanent ſtimulus.

It is recommended,

1. In intermittent fevers, eſpecially when the paroxyſms do not terminate by ſweating, and to aſſiſt the action of Peruvian bark in obſtinate caſes.
2. In typhus, and in putrid diſeaſes, to ſupport the *vis vitæ*, and to excite gentle diaphoreſis.
3. In exanthematous diſeaſes, when the fever is of the ty-

phoid type, to ſupport the action of the ſkin, and keep out the eruption.

4. In gangrene. Externally it is uſed as a gargle in the putrid ſore throat.

It is exhibited,

1. In powder, which is the beſt form, in doſes of twenty or thirty grains.
2. In infuſion with wine or water. By decoction its powers are entirely deſtroyed.

It is often combined with Peruvian bark, or with camphor.

Off. Prep. Tinctura, *Ed. Lond. Dub.* Tinct. cinchon. comp. *Lond. Dub.* Elect. opiat. *Ed.* Cataplaſma cumini, *Lond.*

ARNICA MONTANA. *Flores, Radix.* (*Ed. Dub.*) *Herba, Flos, Radix,* (*Lond.*)

German Leopards-bane. The flower, herb, and root.

Syngeneſia Polygamia ſuperflua.—Nat. ord. *Compoſitæ radiatæ.*

Leopards Bane is a very common perennial plant in the alpine parts of Germany, Sweden, Lapland, and Switzerland. The flowers, which are of a yellow colour and compound, conſiſting entirely of tubular florets, are diſtinguiſhed from ſimilar flowers, with which they are often mixed, from ignorance or fraud, by the common calyx, which is ſhorter than the florets, and conſiſts entirely of lancet-ſhaped ſcales, lying parallel and cloſe to each other, of a green colour, with purple points. The calyx of the different ſpecies of Inula are compoſed of briſtle-ſhaped ſcales, reflected at the points, and beſet with hairs. The florets of the genus Hypochæris are ſtrap-ſhaped.

Theſe flowers have a weak bitteriſh taſte, evidently combined with a degree of acrimony, and when rubbed with the fingers, have a ſomewhat aromatic ſmell. Their active conſtituents are not ſufficiently aſcertained. They evidently contain a great deal of reſin, and ſome eſſential oil.

Medical uſe.—In their effects they are ſtimulating, and ſuppoſed to be diſcutient. In ſmall doſes, and properly adminiſtered, they poſſeſs very beneficial effects, in raiſing the pulſe, in exciting the action of the whole ſanguiferous ſyſtem, in checking diarrhœas, in promoting expectoration, and, moſt particularly, in removing paralytic affections of the voluntary muſcles; but their uſe is frequently attended with no ſenſible operation, except that in ſome caſes of paralyſis, the cure is ſaid to be preceded by a peculiar prickling, and by ſhooting pains in the affected parts. When given improperly, or in too large doſes, they excite an inſupportable degree of anxiety, ſhooting and burning pains, and even dangerous hæmorrhagies, vomiting, vertigo, and coma. For theſe dangerous ſymptoms, vinegar is ſaid to be the beſt remedy.

They have been recommended,

1. In paralytic diſorders, in chronic rheumatiſm, in retention of the urine, from paralyſis of the bladder, in amauroſis.
2. In intermittent fevers, combined with Peruvian bark.
3. In dyſentery and diarrhœa, but in ſome caſes they have had bad effects.
4. In putrid diſeaſes.
5. In typhoid inflammations.
6. To promote the uterine diſcharge.
7. And in internal pains, and congeſtions from bruiſes. In the countries where they are indigenous, the flowers of the leopards-bane have long been a popular remedy in theſe accidents.

They are contraindicated by an inflammatory diatheſis, a prediſpoſition to hæmorrhagies, and internal congeſtions.

They are beſt exhibited in the form of infuſion. One or two ſcruples may be infuſed with half a pound of water, and drunk at proper intervals. The flowers ſhould be wrapt up in a piece of linen, as otherwiſe their down is apt to be diffuſed in the liquid, and to cauſe violent irritation of the throat.

The dried root of this plant is about the thickneſs of a ſmall quill, and ſends out fibres along one ſide. Externally it is rough, and of a red brown colour, internally of a dirty white. Its taſte is acrid, and ſlightly bitter. Neumann extracted from 960 parts 840 watery extract, and 5 alcoholic, and inverſely 270 alcoholic, and 540 watery.

Medical uſe.—It is exhibited in the ſame manner and circumſtances as the flowers, but it is more apt to excite vomiting. In powder its doſe is from five to ten grains.

ARSENICUM.

Arſenic.

The general properties of this metal have been already enumerated.

Arſenic is found,

I. In its metallic ſtate :

1. Alloyed with iron. Native arſenic.
2. ———————— iron and gold.
3. ———————— cobalt.
4. Combined with iron and ſulphur. Arſenical pyrites.

5. Combined with iron, ſulphur, and ſilver. White arſenical pyrites.

II. Oxidized :
1. Uncombined. White oxide of arſenic. Arſenious acid.
2. Combined with ſulphur:
    a. Oxide of arſenic 90, ſulphur 10, Orpiment. Yellow ſulphuretted arſenic.
    b. Oxide of arſenic 84, ſulphur 16, Realgar. Red ſulphuretted arſenic.

III. Acidified and combined:
1. With lime.
2. With copper.
3. With iron.
4. With lead.
5. With nickel.
6. With cobalt.

OXIDUM ARSENICI. (*Ed.*)

Oxide of arſenic. (Arſenious acid, Fourcroy.)

THIS ſubſtance, which was formerly named, improperly, arſenic, is moſt generally obtained in the proceſs of roaſting the ores of cobalt in Saxony. The roaſting is performed in a kind of reverberatory furnace, with which a very long chimney is connected, lying in a horizontal direction. The arſenious acid is condenſed in it in the form of a looſe grey powder, which, by a ſecond ſublimation with a little potaſs, and in a great degree of heat, coaleſces into a firm vitreous ſublimate, which gradually becomes opaque by expoſure to the air. In this ſtate it is the white arſenic of commerce, or, as it ſhould be termed, the arſenious acid. For internal uſe, the lumps of a ſhining appearance and dazzling whiteneſs ſhould be choſen; but it is generally offered to ſale in the form of powder, which is very often mixed with chalk or gypſum. The fraud is eaſily detected by expoſing it to heat. The arſenious acid is entirely ſublimed, and the additions remain behind.

As this ſubſtance is one of the moſt virulent poiſons, we ſhall give a full account of its properties. It is white, compact, brittle, and of a glaſſy appearance. Its taſte is ſweetiſh, but acrid and ſlow in manifeſting itſelf. It ſublimes entirely when expoſed to 283° Fahrenheit. When the operation is performed in cloſe veſſels, the arſenious acid aſſumes a glaſſy appearance, which it ſoon looſes on expoſure to the air. In open veſſels it ſublimes in denſe white fumes, ſmelling ſtrongly of garlic. If a plate of copper be expoſed to the fumes, it is whitened. Arſenious acid is ſoluble in 80 parts of water at 60°, and in 15 at 212°. This ſolution has an acrid taſte, and reddens vegetable blues. It is alſo ſoluble in 80 parts of boiling alcohol. From either ſolution it may be obtained regularly cryſtallized in tetrahedrons. From its ſolutions a graſs-green precipitate is ſeparated by a ſolution of ſulphate of iron, a white precipitate by lime-water, and a yellow precipitate by any of the combinations of an alkali with ſulphur, or with ſulphur and hydrogen. All theſe precipitates, when expoſed to a ſufficient temperature, ſublime entirely, and emit the ſmell of garlic.

When treated with nitric acid, the arſenious acid is converted into arſenic acid.

But by far the ſureſt teſt of the preſence of arſenic, is its reduction by carbonaceous ſubſtances.

With this view, a ſmall quantity of any ſuſpected ſubſtance may be mixed with ſome fatty or oily matter, and introduced within a tube cloſed at the bottom, and expoſed to a red heat; if arſenic be preſent in any ſtate, it will be ſublimed in the form of brilliant metallic ſcales.

Arſenious acid is uſed by the dyers, as a flux in glaſs-making, in docimaſtic works, and in ſome glazes. Arſenious ſulphurets are much uſed by painters, but theſe advantages are not able to compenſate for its bad effects. In mines, it cauſes the deſtruction of numbers who explore them; being very volatile, it forms a duſt, which affects and deſtroys the lungs, and the unhappy miners, after a languiſhing life of a few years, all periſh ſooner or later. The property which it poſſeſſes of being ſoluble in water, increaſes and facilitates its deſtructive power; and it ought to be proſcribed in commerce, by the ſtrict law which prohibits the ſale of poiſons to unknown perſons. Arſenious acid is every day the inſtrument by which victims are ſacrificed, either by the hand of wickedneſs or imprudence. It is often miſtaken for ſugar; and theſe miſtakes are attended with the moſt dreadful conſequences. The ſymptoms which characterize this poiſon are a great conſtriction of the throat, the teeth ſet on edge, and the mouth ſtrongly heated, an involuntary ſpitting, with extreme pains in the ſtomach, vomiting of glairous and bloody matter, with cold ſweats and convulſions.

On diſſection, the ſtomach and bowels are found to be inflamed, gangrenous and corroded, and the blood is fluid. Soon after death, livid ſpots appear on the ſurface of the body, the nails become blue, and often fall off along with the hair, the epidermis ſeparates, and the whole body becomes very ſpeedily putrid. When the quantity is ſo very ſmall as not to prove fatal, tremors, palſies, and lingering hectics ſucceed.

Mucilaginous drinks have been long ago given to perſons poiſoned by arſenic. Milk, fat, oils, and butter, have been ſucceſſively employed. M. Navier has propoſed a more direct counterpoiſon.

He preſcribes one drachm of ſulphuret of potaſs to be diſſolved in a pint of water, which the patient is directed to drink at ſeveral draughts: the ſulphur unites to the arſenic, and deſtroys its cauſticity and effects. When the firſt ſymptoms are alleviated, he adviſes the uſe of ſulphureous mineral waters. He likewiſe approves the uſe of milk, but condemns oils. Vinegar which diſſolves arſenic, has been recommended by M. Sage, but upon what grounds we know not.

According to Hahneman a ſolution of ſoap is the beſt remedy. One pound of ſoap may be diſſolved in four pounds of water, and a cupful of this ſolution may be drunk lukewarm every three or four minutes.

Medical uſe.—Notwithſtanding, however, the very violent effects of arſenious acid, it has been employed in the cure of diſeaſes, both as applied externally, and as taken internally. Externally it has been chiefly employed in caſes of cancer.

Juſtamond uſed an ointment compoſed of four grains of white oxide of arſenic, ten grains of opium, and a drachm of cerate, and ſpread very thin upon linen. But its action is tedious. He alſo fumigated cancerous ſores with ſulphuret of arſenic, with a view to deſtroy their intolerable fetor, with great ſucceſs. Le Febure waſhed cancerous ſores frequently, in the courſe of the day, with a ſolution of four grains of arſenious acid in two pounds of water. Arneman recommends an ointment of one drachm of arſenious acid, the ſame quantity of ſulphur, an ounce of diſtilled vinegar, and an ounce of ointment of white oxide of lead, in cancerous, and obſtinate, ill-conditioned ſores, and in ſuppurated ſcrofulous glands. The arſenious acid has even been applied in ſubſtance, ſprinkled upon the ulcer. But this mode of uſing it is exceſſively painful, and extremely dangerous. There have been even fatal effects produced from its abſorption.

The principal thing to be attended to in arſenical applications, is to dimiſh their activity to a certain degree. They then cauſe little irritation or pain, but rather excite a gentle degree of inflammation, which cauſes the diſeaſed parts to ſlough off; and it has the peculiar advantage of not extending its operation laterally.

No other eſcharotic poſſeſſes equal powers in cancerous affections; but unfortunately its good effects often do not go beyond a certain length, and if in ſome caſes it effects a cure, in others it muſt be allowed it does harm. While it has occaſioned very conſiderable pain, it has given the parts no diſpoſition to heal, the progreſs of the ulceration becoming even more rapid than before.

Arſenical preparations have been alſo uſed internally.

It may be exhibited in the form,

1. Of arſenious acid diſſolved in diſtilled water, in the propor-

tion of four grains to a pint. A table ſpoonful of this ſolution, mixed with an equal quantity of milk, and a little ſyrup of poppies is directed to be taken every morning faſting, and the frequency of the doſe gradually increaſed until ſix table ſpoonfuls be taken daily. M. Le Febure's method of curing cancer.

2. Of arſenite of potaſs. Sixty-four grains of arſenious acid, with an equal quantity of carbonate of potaſs, are to be boiled together until the arſenious acid be diſſolved, when as much water is to be added as will increaſe the ſolution to one pound. Of this, from two to twelve drops may be given once, twice, or oftener, in the courſe of a day. Dr. Fowler's method of curing intermittent fever.

3. Of arſeniate of potaſs. Mix well together equal quantities of nitrate of potaſs, and of pure arſenious acid; put them into a retort, and diſtil at firſt with a gentle heat, but afterwards with ſo ſtrong a heat as to redden the bottom of the retort. In this proceſs the nitric acid is partly decompoſed, and paſſes over into the receiver in the ſtate of nitrous acid. The arſenious acid is at the ſame time converted into arſenic acid, and combines with the potaſs. The product, which is arſeniate of potaſs, is found in the bottom of the retort, which may be obtained in the form of cryſtals of a priſmatic figure, by diſſolving it in diſtilled water, filtering the ſolution through paper, evaporating and cryſtallizing. Mr. Macquer.

4. Arſenious acid, in ſubſtance, to the extent of an eighth of a grain for a doſe, combined with a little of the flowers of ſulphur, has been ſaid to be employed internally in ſome very obſtinate caſes of cutaneous diſeaſes, and with the beſt effect.

Notwithſtanding the ſucceſsful exhibition of arſenic by Dr. Fowler and other eminent practitioners, and notwithſtanding its daily uſe as a domeſtic remedy in the fenny parts of England, and other countries, for the cure of intermittent fevers, it is ſuſpected on ſuch ſtrong grounds of undermining the conſtitution, and laying the foundation for mortal diſeaſes, that its general uſe ought to be diſcouraged. The French directory were, however, of a different opinion, when they publiſhed an edict ordering the ſurgeons of the Italian army to free the numberleſs ſoldiers who were ſeized with agues in the marſhes of Lombardy, of their complaints, in the courſe of two or three days, and at the expence of as many ſous, under the pains of military puniſhment.

ARTEMISIA.—*Syngeneſia Polygamia ſuperflua.*—Nat. ord. *Compoſitæ diſcoideæ.*

Sp. Artemisia Abrotanum. *Abrotanum. Folium.* (*Lond.*)
Southernwood. The leaves.

This is a perennial ſhrub, which grows readily in our gardens, though a native of the ſouth of Europe.

Southernwood has a ſtrong ſmell, which, to moſt people, is not diſagreeable; it has a pungent, bitter, and ſomewhat nauſeous, taſte. Theſe qualities are very completely extracted by alcohol, and the tincture is of a beautiful green colour. They are leſs perfectly extracted by watery liquors, the infuſion being of a light brown colour.

Medical uſe.—Southernwood, as well as other ſpecies of the ſame genus, particularly the abſinthium and ſantonica, has been recommended as an anthelmintic; and it has alſo been ſometimes uſed as a ſtimulant, detergent, and ſudorific. Externally, it has been employed in diſcutient and antiſeptic fomentations; and under the form of lotion and ointment for cutaneous eruptions, and for preventing the hair from falling off. But it is at preſent very rarely uſed in any way.

Off. prep.—Decoct. pro foment. *Lond.*

Sp. Artemisia Maritima.
Abſinthium Maritimum. Cacumina. (*Lond. Dub.*)
Sea Wormwood. The tops.

This ſpecies of artemeſia is perennial and herbaceous. It grows wild in ſalt marſhes, and in ſeveral parts about the ſea-coaſts. In taſte and ſmell it is weaker and leſs unpleaſant than the common wormwood. The tops of ſea wormwood formerly entered ſome of the compound diſtilled waters; but they are now rejected from theſe, and are very little employed in practice.

Off. prep. Decoct. pro foment. *Lond.* Conſerv. *Lond.*

Sp. Artemisia Santonica. *Cacumen.* (*Ed.*)
Santonicum. Cacumen. (*Lond.*) *Semina.* (*Dub.*)
Wormſeed. The tops. The ſeeds.

All the Britiſh colleges have given this ſpecies as the plant which produces theſe ſeeds, but it is by no means aſcertained. They have been aſcribed by different writers to other ſpecies of the ſame genus, the Judaica, the Contra, and the Auſtriaca, and are even ſaid by Saunders to be the produce of a ſpecies of Chenopodium.

The ſeeds themſelves are ſmall, oblong, ſmooth, and of a greeniſh or greyiſh yellow colour. As the whole head is gathered after the ſeeds are ripe, they are mixed with the ſcales of the calices and bits of ſtalks. Their taſte is bitter, and ſomewhat acrid; their ſmell ſtrong and diſagreeable. Thoſe which come from Aleppo are eſteemed the beſt, and thoſe from Barbary the worſt. When they have no ſmell, and a leſs intenſely bitter taſte, and are diſcoloured, and mixed with a longer kind of ſeed, they are to be rejected. They are alſo adulterated with the ſeeds of tanſy and wormwood. The latter are eaſily known, by having a light yellow colour, and reſembling powdered hay more than ſeeds. Neumann obtained from 480 parts 213 of alcoholic extract, and 110 watery, and inverſely 260 watery, and 28 alcoholic. It gave a ſlight flavour to water diſtilled from it, but no oil.

Medical uſe.—Wormſeed is one of the oldeſt and moſt common anthelmintics, eſpecially in the lumbrici of children. On account of their eſſential oil, they are heating and ſtimulating.

They are given to children

1. In ſubſtance, to the extent of ten grains, or half a drachm, finely powdered, and ſtrewed on bread and butter; or made into an electuary with honey or treacle; or candied with ſugar; or diffuſed through milk, and taken in the morning when the ſtomach is empty.
2. In infuſion or decoction, but to theſe forms their bitterneſs is a ſtrong objection.

After they have been uſed for ſome days, it is cuſtomary to give a cathartic, or they are combined from the beginning with rhubarb, jalap, calomel, ſulphate of iron, or muriate of ammonia.

Sp. ARTEMISIA ABSINTHIUM. *Folia et ſummitates florentes.* (*Ed.*) *Abſinthium vulgare.* *Herba.* (*Lond.*) *Folia, cucumina.* (*Dub.*)

Common wormwood. The herb, leaves, and flowering heads.

THIS perennial herb grows by the road-ſides and on rubbiſh in many parts of Britain; and about London it is cultivated for medical uſe. Its ſmell is ſtrong and diſagreeable; its taſte intenſely bitter. Its active conſtituents are bitter extractive and eſſential oil. It is uſed in ſtomach complaints, and is of great ſervice to hypochondriſts. It is alſo employed in intermittent fevers, in cachectic and hydropic affections, in jaundice, and againſt worms. Many perſons cannot ſuffer the diſagreeable ſmell of wormwood, which is apt to occaſion headach, but it may be freed from it in a great meaſure by decoction. The extract is a pure and ſimple bitter. The eſſential oil is of a dark green colour, and contains the whole flavour of the plant. It is ſtimulating, and is ſuppoſed to be a powerful antiſpaſmodic and anthelmintic. It was formerly much uſed for the preparation of medicated wines and ales.

ARUM MACULATUM. *Arum. Radix recens.* (*Lond. Dub.*)

Wake-robin. The recent root.

Gynandria Polyandria.—Nat. ord. *Piperitæ.*

THIS is a perennial ſolid bulbous rooted plant, which grows wild in ſhady ſituations, and by the ſides of banks, in many parts of Britain. The root is knotty, roundiſh and white. When collected in ſpring before the leaves ſhoot, or in autumn after flowering, it contains a milky juice of very great acrimony. Applied to the tongue, it cauſes a burning heat, which laſts for many hours, and excites conſiderable thirſt. Theſe diſagreeable ſymptoms may be relieved by butter-milk or oily fluids. Rubbed between the fingers, it bliſters and excoriates them; it is therefore a corroſive vegetable poiſon. By drying, it loſes the greateſt part of its acrimony, and becomes ſimply amylaceous. It is alſo rendered perfectly mild by frequent waſhing with water. Its acrimony is therefore eaſily deſtructible; and as it does not ariſe from the preſence of an eſſential oil, it depends upon a vegetable principle, different from all others, and not well underſtood. It does not riſe in diſtillation either with alcohol or with water, and is not contained in its extract, although the root is thereby deprived of it. Neumann obtained from 480 of the dry root 20 of alcoholic extract, and about 180 watery. The former had ſome ſlight pungency, the latter none.

Medical uſe.—In the recent root, the degree of acrimony is ſo very uncertain, and often ſo exceſſive, that its effects, as an internal remedy, cannot be depended on. The dried root is perfectly inert; but the roots may be kept freſh for a year, by burying them in a cellar in ſand.

Off. prep. Conſerv. *Lond.*

ASARUM EUROPÆUM. *Aſarum. Folia.* (*Dub. Lond.*)

Aſarabacca. The leaves.

Willd. g. 925. *ſp.* 1.—*Dodecandria Monogynia.*—Nat. ord. *Sarmentaceæ.*

THIS is a perennial plant, which is a native of ſome places of England, although the dried roots are generally brought from the Levant. It grows in moiſt and ſhady ſituations. It produces only two leaves, which are uniform and very obtuſe. The root is fibrous, of a grey-brown colour externally, but white within. Both the roots and leaves have a nauſeous, bitter, acrimonious, hot, taſte; their ſmell is ſtrong, and not very diſagreeable.

In its analyſis, it is ſaid by Neumann to agree with ipecacuana, but it ſeems to contain, beſides its odorous principle, which is probably camphor, a portion of the ſame acrid principle which has been noticed when ſpeaking of arum. Upon this its virtues depend; and as this principle is volatile, we find accordingly that aſarabacca loſes much of its activity by decoction and long keeping.

Given in ſubſtance from half a drachm to a drachm, it evacuates powerfully both upwards and downwards. It is ſaid, that tinctures made in ſpiritous menſtrua, poſſeſs both the emetic and cathartic virtues of the plant: that the extract obtained by inſpiſſating theſe tinctures acts only by vomiting, and with great mildneſs: that an infuſion in water proves cathartic, rarely emetic: that aqueous decoctions made by long boiling, and the watery extract, have no purgative or emetic quality, but prove good diaphoretics, diuretics, and emmenagogues.

The principal uſe of this plant among us is a ſternutatory. The root of aſarum is perhaps the ſtrongeſt of all the vegetable errhines, white hellebore itſelf not excepted. Snuffed up the noſe, in the quantity of a grain or two, it occaſions a large evacuation of mucus, and raiſes a plentiful ſpitting. The leaves are conſiderably milder, and may be uſed to the quantity of three, four, or five grains. Geoffroy relates, that after ſnuffing up a doſe of this errhine at night, he has frequently obſerved the diſcharge from the noſe to continue for three days together; and that he has known a paralyſis of the mouth and tongue cured by one doſe. He recommends this medicine in ſtubborn diſorders of the head, proceeding from viſcid tenacious matter, in palſies, and in ſoporific diſtempers.

Off. prep.—Pulv. comp. *Ed. Lond. Dub.*

ASTRAGALUS TRAGACANTHA. *Gummi.* (*Ed.*)
Tragacantha Gummi. (*Lond. Dub.*)
Gum-Tragacanth.
Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*

Gum-Tragacanth is the produce of a very thorny ſhrub, which grows on the iſland of Candia, and other places in the Levant.

About the end of June a fluid exudes from the ſtem and larger branches, which dries in the ſun, and is collected by the ſhepherds on Mount Ida, from whence it is ſent to Europe, under the title of Tragacanth.

It conſiſts of whitiſh ſemi-tranſparent vermiform pieces, ſcarcely a line in thickneſs, without taſte or ſmell.

There is alſo a dirty yellow, or browniſh kind, which is not fit for medical purpoſes.

Tragacanth is difficultly pulverizable, unleſs when thoroughly dried, and the mortar heated, or in froſt. According to Neumann, it gives nothing over in diſtillation, either to water or alcohol: alcohol diſſolves only about 10 parts of 480, and water the whole. Lewis, however, more accurately obſerves, that it cannot be properly ſaid to be diſſolved, for, put into water, it abſorbs a large proportion of that fluid, increaſing immenſely in volume, and forming with it a ſoft, but not fluid, mucilage; and although it is eaſily diffuſed through a larger proportion of water, after ſtanding a day or two, the mucilage ſubſides again, the ſupernatant fluid retaining little of the gum.

Beſides theſe remarkable differences from gum-arabic in regard to brittleneſs, inſolubility, and the quantity of water which it thickens, I find that tragacanth is not precipitated by ſilicized potaſs, and is precipitated by ſulphate of copper and acetate of lead.

In pharmacy it is employed for forming powders into troches, and rendering tough coheſive ſubſtances, ſuch as colocynth, pulverizable by beating them with mucilage of tragacanth, and then drying the maſs. For electuaries it is improper, as it renders them ſlimy on keeping.

Off. prep.—Pulv. comp. *Lond.* Pulv. ceruſſæ comp. *Lond.* Mucilago, *Ed. Lond. Dub.* Trochiſci glycyrr. *Lond. Dub.* Trochiſci nitri, *Lond.*

ATROPA BELLADONNA. *Folia.* (*Ed.*) *Belladonna. Folia.* (*Dub.*)

Deadly nightſhade. The leaves.

Willd. g. 381. *ſp.* 2.—*Pentandria Monogynia.*—Nat. ord. *Solanaceæ.*

The deadly Nightſhade is a perennial plant, with a herbaceous ſtem, which is indigenous both in mountainous and woody ſituations in this country, and often cultivated in gardens. The whole plant is poiſonous, and the berries, from their beautiful appearance, have ſometimes proved fatal to children. The ſymptoms excited, are, a dryneſs of the mouth; a trembling of the tongue; a very diſtreſſing thirſt; a difficulty of ſwallowing; fruitleſs efforts to vomit; and great anxiety about the præcordia. Delirium then comes on, with gnaſhing of the teeth, and convulſions. The pupil remains dilated, and is not ſenſible even to the ſtimulus of light. The face becomes tumid, and of a dark red colour. The jaws are frequently locked. Inflammation attacks the œſophagus, ſtomach, and inteſtines, ſometimes extending to the meſentery, lungs, and liver, accompanied with violent pains in the abdomen. The ſtomach is very inſenſible to ſtimulus, and the periſtaltic motion of the inteſtines is deſtroyed. General relaxation, palſy, eſpecially of the lower extremities, convulſions, vertigo, blindneſs, coma, and death, ſucceed. The body ſoon putrifies, ſwells, and becomes marked with livid ſpots; blood flows from the noſe, mouth, and ears, and the ſtench is inſufferable. On diſſection, the blood is found to be fluid, the inteſtines are inflated and inflamed, or eroded and gangrenous. The beſt method of cure is to excite vomiting as ſoon as poſſible, by emetics and tickling the fauces; to evacuate the bowels by purgatives and glyſters; and to give, largely, vinegar, honey, milk, and oil. In ſome children who recovered by this treatment, the delirium was ſucceeded by profound ſopor, accompanied with ſubſultus tendinum; the face and hands became pale and cold, and the pulſe ſmall, hard and quick. Their recovery was ſlow, and the blindneſs continued a conſiderable time, but at laſt went off.

By diſtillation in the vapor bath, Geoffrey procured from the recent leaves a ſlightly acrid liquor, and the reſiduum by deſtructive diſtillation yielded a ſuitable quantity of carbonate of ammonia.

Medical uſe.—Yet this virulent poiſon, under proper management, may become an excellent remedy. Beſides a very remarkable narcotic power, it poſſeſſes conſiderable influence in promoting all the excretions, particularly by ſweat, urine, and it is alſo ſaid by ſaliva; but its exhibition requires the greateſt caution; for it is apt, when continued for any length of time, even in ſmall doſes, to cauſe dryneſs and tenſion of the throat and neighbouring parts, vertigo, dimneſs of ſight, and even temporary blindneſs. When any of theſe ſymptoms occur, its uſe muſt be ſuſpended for ſome time, and afterwards reſumed in ſmaller doſes.

Deadly nightſhade has been exhibited

1. In ſeveral febrile diſeaſes; in obſtinate intermittents; and in the plague.
2. In inflammations; the gout.
3. In comatoſe diſeaſes; in palſy and loſs of ſpeech from apoplexy.
4. In ſpaſmodic diſeaſes; in chorea; epilepſy; chincough; hydrophobia; melancholy, and mania.
5. In cachectic affections; in dropſies and obſtinate jaundice.
6. In local diſeaſes; in amauroſis; in ſchirrhus, and cancer.

Deadly nightſhade is beſt exhibited in ſubſtance, beginning with a very ſmall doſe of the powdered leaves or root, ſuch as the fourth or eighth part of a grain for children, and one grain for adults, to be repeated daily, and gradually increaſed. In hydrophobia, Münch gave the powdered root every ſecond morning, to the extent of from one to five grains to children, and fourteen or fifteen grains to adults.

The watery infuſion is alſo a powerful remedy. One ſcruple of the dried leaves are infuſed in ten ounces of warm water, and ſtrained after cooling. At firſt two ounces of this may be given daily to adults, and gradually increaſed, until the tenſion of the throat ſhews that it would be imprudent to go farther.

The watery extract is not a judicious preparation.

Externally, the powdered leaves are applied as a narcotic to diminiſh pain, and to cancerous and ill-conditioned ſores. From its effect in permanently dilating the pupil, Profeſſor Reimarus propoſed, and tried with ſucceſs, the dropping a little of the infuſion into the eye, a few hours before performing the operation for the cataract, with the view of facilitating the operation.

Off. prep.—Succ. ſpiſſ. atrop. bell. *Ed.*

AVENA SATIVA. *Semen.* (*Ed.*) *Avena. Semen.* (*Lond.*)
Oats. The ſeed.

Willd. g. 142. *ſp.* 13.—*Triandria Digynia.*—Nat. ord. *Gramina.*

THIS is a well-known annual plant, which is very generally cultivated in northern countries, and in many places furniſhes their principal ſubſiſtence. When ſimply freed from the huſks, this grain gets the name of groats, but it is more frequently ground into meal. Groats are made into broths. Oat-meal is baked with ſalt and water into cakes, or with the ſame additions, is boiled to form porridge. An infuſion of the huſks in water, allowed to remain till it become acidulous, is boiled down to a jelly, which is called ſowins. In all theſe forms it is nutritious, and eaſy of digeſtion.

Medical uſe.—Gruels or decoctions, either of groats or oat-meal, either plain or acidified, or ſweetened, form an excellent drink in febrile diſeaſes, diarrhœa, dyſentery, &c. and from their demulcent properties, prove uſeful in inflammatory diſorders, coughs, hoarſeneſs, roughneſs, and exulcerations of the fauces. Porridge is alſo frequently applied to phlegmenous ſwellings, to promote their ſuppuration.

BERBERIS VULGARIS. *Berberis. Fructus.* (*Dub.*)
Barberry. The fruit.

Willd. g. 677. *ſp.* 1.—*Hexandria Monogynia.*—Nat. ord. *Tribilatæ.*

THE barberry is a ſmall tree, or rather a large buſh, covered with an aſh-coloured bark, under which is contained another of a deep yellow: the berries are of an elegant red colour, and contain each two hard brown ſeeds. It grows wild on chalky hills in ſeveral parts of England; and is frequently planted in hedges and in gardens.

The outward bark of the branches and the leaves have an aſtringent acid taſte: the inner yellow bark a bitter one. This laſt is ſaid to be ſerviceable in the jaundice; and by ſome to be an uſeful purgative.

The berries contain a very acid red juice, which conſiſts chiefly of malic acid. This juice forms a uſeful and pleaſant addition to antiphlogiſtic drinks, in fluxes and in malignant fevers, for abating heat, quenching thirſt, raiſing the ſtrength, and preventing putrefaction. They alſo form a very elegant ſyrup or preſerve, which may be employed with advantage in the ſame diſeaſes.

BETULA ALBA. *Succus.* (*Dub.*)
The birch tree. The juice.
Monœccia Tetrandria.—Nat. ord. *Amentaceæ.*

This tree grows wild in moſt woods: its bark is aſtringent.

Upon deeply wounding or boring the trunk of the tree in the beginning of ſpring, a ſweetiſh juice iſſues forth, ſometimes, it is ſaid, in ſo large a quantity, as to equal in weight the whole tree and root: one branch will bleed a gallon or more in a day. This juice is chiefly recommended in ſcorbutic and ſimilar diſorders: its moſt ſenſible effect is to promote the urinary diſcharge.

BITUMEN PETROLEUM. (*Ed.*) *Petroleum.* (*Lond.*)
Petroleum Barbadenſe. *Reſina.* (*Dub.*)
Rock oil. Barbadoes tar.

Bitumen is now employed as the generic name for ſeveral inflammable bodies of different degrees of conſiſtency, from perfect fluidity to that of a brittle but very fuſible ſolid, and of little ſpecific gravity. They are inſoluble in alcohol or in water, combine with eſſential oils and ſulphur, decompoſe only a ſmall proportion of nitrate of potaſs by deflagration, and on inflammation leave little or no reſiduum.

Sp. 1. Naphtha. It is nearly as colourleſs, tranſparent, and fluid as water. Specific gravity 0.729 to 0.847, of a highly penetrating, yet not diſagreeable, ſmell, ſomewhat like that of rectified oil of amber, very volatile, and remaining fluid at 0° Fahrenheit.

Sp. 2. Petroleum. Not ſo fluid, tranſparent, or colourleſs, as the former; ſmell leſs pleaſant. Specific gravity 0.878.

Sp. 3. Mineral Tar. Viſcid; of a dark colour; ſmell ſometimes ſtrong, but often faint. Specific gravity 1.1.

Sp. 4. Mineral Pitch; maltha. Brittle in cold weather; of a dark colour; opaque. Specific gravity probably 1.07.

Sp. 5. Asphaltum. Very brittle; fracture conchoidal; glaſſy luſtre; no ſmell, unleſs when melted or heated. Specific gravity 1.07 to 1.65. Fuſible and inflammable.

According to Mr. Kirwan and Mr. Hatchett, the firſt ſpecies, by expoſure to the air, and gradual decompoſition, paſſes ſucceſſively through the intermediate ſtates, till at laſt it is converted into aſphaltum. When partially decompoſed, the remaining naphtha may be ſeparated by diſtillation from the ſuperabundant charcoal.

From the different pharmacopœias having been publiſhed before the ſpecific characters were properly aſcertained, there is ſome confuſion with regard to the ſpecies which is officinal. The London college name the ſecond, and the Dublin college the third; but the latter err greatly in calling it a reſin; while the Edinburgh college incorrectly give petroleum Barbadenſe, which belongs to the third ſpecies, as a ſynonime of bitumen petroleum, which is the ſecond. The firſt ſpecies is found abundantly in Perſia; but what we receive comes from the duchy of Modena in Italy. It is very rarely met with in the ſhops; the ſecond, mixed with a little of the third, and ſome ſubtile oil, is uſually ſent us inſtead of it.

Medical uſe.—Petroleum is at preſent very rarely employed as a medicine, though if the finer kinds could be procured genuine, they ſeem to deſerve ſome notice: they are more agreeable than the oil of amber, and milder than that of turpentine; of the virtues of both of which they participate. They are principally recommended by authors for external purpoſes, againſt pains and aches, in paralytic complaints, and for preventing chilblains. For theſe intentions, ſome of the more common mineral oils have been made uſe of with good ſucceſs; an oil extracted from a kind of ſtone-coal has been extolled among the common people, under the name of Britiſh oil, for rheumatic pains, &c.; even this is often counterfeited by a ſmall portion of oil of amber added to the common expreſſed oils.

The Barbadoes tar is found in ſeveral of the Weſt-India iſlands, where it is eſteemed by the inhabitants of great ſervice as a ſudorific, and in diſorders of the breaſt and lungs; though in caſes of this kind, attended with inflammation, it is certainly improper; they likewiſe apply it externally as a diſcutient, and for preventing paralytic diſorders.

Off. prep.—Ol. petrolei, *Lond.* Petrol. ſulph. *Lond.*

BOLETUS IGNIARIUS. (*Ed.*) *Agaricus chirurgorum. Off.*
Female agaric, or agaric of the oak, called, from its being very eaſy inflammable, Touchwood, or Spunk.

Cryptogamia Fungi.—Nat. ord. *Fungi.*

This fungus is frequently met with, on different kinds of trees, in Britain, eſpecially the cherry and plumb; and is ſaid to have been ſometimes brought into the ſhops mixed with the true agaric of the larch: from this it is eaſily diſtinguiſhable by its greater weight, duſky colour, and mucilaginous taſte void of bitterneſs.

The medullary part of this fungus, beaten ſoft, and applied externally, has been much celebrated as a ſtyptic; and ſaid to reſtrain not only venal but arterial hæmorrhagies, without the uſe of ligatures. It does not appear, however, to have any real ſtyptic power, or to act any otherwiſe than dry lint, ſponge, or other ſoft fungous applications. It is beſt when gathered in Auguſt or September.

BOLUS GALLICUS. (*Lond.*)

French bole.

Boles are earthy aggregates, conſiſting chiefly of ſiliceous and argillaceous earths. They are leſs coherent and more friable than pure clay, more eaſily diffuſed through water, and more freely ſubſiding from it. They feel greaſy to the touch, adhere ſlightly to the tongue, and break down in the mouth, impreſſing a light ſenſe of aſtringency. A great variety of theſe ſubſtances were formerly uſed in medicine, but the French bole alone is now retained in the London pharmacopœia. It is of a pale red colour, variegated with irregular ſpecks or veins of white and yellow.

Theſe earths have been recommended as aſtringent, ſudorific, and alexipharmic; and they have been uſed in diarrhœas, dyſenteries, hæmorrhagies, and in malignant and peſtilential diſtempers. In inteſtinal fluxes and complaints in the firſt paſſages, from thin acrimonious humours, they may doubtleſs be of ſome uſe: but the virtues aſcribed to them in the other caſes appear to have no foundation.

BRYONIA ALBA. (*B. dioica, Jacquin, Withering.*) *Bryonia. Radix.* (*Dub.*)

Bryony; wild vine. The root.

Monœcia Syngeneſia.—Nat. ord. *Cucurbitaceæ.*

This is an indigenous perennial plant, growing on dry banks, under hedges, and climbing upon the buſhes. The roots are large, ſometimes as thick as a man's thigh; their ſmell, when freſh, is ſtrong and diſagreeable; the taſte nauſeouſly bitter, acrid, and biting; the juice is ſo ſharp as in a little time to excoriate the ſkin: in drying they loſe great part of their acrimony, and almoſt the whole of their ſmell.

Neumann obtained by expreſſion from a pound of the freſh root nearly ſix ounces of juice, retaining a great deal of the nauſeous ſmell and taſte of the root, and depoſiting, on ſtanding, a white powdery amylaceous matter, (Fecula bryoniæ) recommended as a milder purgative than the root. 960 parts of the dry root yielded to water 606, and afterwards to alcohol 23. Alcohol, when applied firſt, extracted 170, and water afterwards 250.

Medical uſe.—Bryony root is a ſtrong irritating cathartic; and as ſuch has ſometimes been ſucceſsfully exhibited in maniacal caſes, in ſome kinds of dropſies, and in ſeveral chronical diſorders. An extract prepared by water acts more mildly, and with greater ſafety, than the root in ſubſtance; given from half a drachm to a drachm, it is ſaid to prove a gentle purgative, and likewiſe to operate powerfully by urine. The freſh root, applied externally, is ſaid to be a powerful diſcutient in œdematous ſwellings.

BUBON GALBANUM *Gummi-reſina.* (*Ed.*) *Galbanum. Gummi-reſina.* (*Lond. Dub.*)

Galbanum. A gum-reſin.

Willd. g. 546. *ſp.* 2.—*Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

THIS plant is perennial, and grows in Africa. It abounds with a milky juice, which ſometimes exudes from the joints of the old plants, but is more frequently obtained by cutting them acroſs ſome inches above the root. The juice which flows from the wound ſoon hardens, and is the galbanum which is brought to us from Syria and the Levant.

The beſt ſort of galbanum conſiſts of pale-coloured pieces, about the ſize of a hazel nut, which, on being broken, appear to be compoſed of clear white tears, of a bitteriſh acrid taſte, and a ſtrong peculiar ſmell. But it moſt commonly occurs in agglutinated maſſes, compoſed of yellowiſh or reddiſh and clear white tears, which may be eaſily torn aſunder, mixed with ſeeds and leaves, of the conſiſtence of firm wax, ſoftening by heat, and becoming brittle by cold. What is mixed with ſand, earth, and other impurities, and is of a brown or blackiſh colour, interſperſed with no white grains, of a weak ſmell, and of a conſiſtence always ſoft, is bad.

Galbanum is almoſt entirely ſoluble in water, but the ſolution is milky; neither do wine nor vinegar diſſolve it perfectly. Alcohol, according to Hagen, has very little action upon it. It is not fuſible; but furniſhes a conſiderable proportion of eſſential oil when diſtilled with water. Neumann obtained by diſtillation with water ſix drachms of oil, beſides what was diſſolved in the water. The watery extract amounted to about three ounces. It had ſomewhat of a nauſeous reliſh, but could not have been recognized as a preparation of galbanum. From the ſame quantity alcohol extracted upwards of nine ounces and a half of a hard brittle inſipid inodorous ſubſtance (reſin?)

Medical uſe.—Galbanum agrees in virtue with gum ammoniacum; but is generally accounted leſs proper in aſthmas, and more ſo in hyſterical complaints. It is exhibited in the form of pills or emulſion, to the extent of about a drachm. Applied externally, it is ſuppoſed to reſolve and diſcuſs tumours, and to promote ſuppuration.

Off. prep.—Galb. purif. Pil. g. comp. *Lond.* Pil. aſſæ fœt. comp. *Ed.* Tinct. galb. *Lond.* Emplaſt. picis burgund. *Dub.* E. aſſæ fœtid. *Ed.* E. gummos, *Ed.* E. lith. comp. *Lond.*

CALX. (*Lond.*) *Calx viva. Ed. Calx recens uſta.* (*Dub.*)
a. Ex lapide calcareo.
b. Ex teſtis conchyliorum.
Quicklime recently burnt.

Lime is a ſimple ſubſtance, the properties of which have been already enumerated. It is ſcarcely found in nature uncombined; but is eaſily prepared from any of its carbonates, either mineral or animal, by the action of fire, which firſt expels the water, and then deſtroys any animal matters which may be preſent, and, laſtly, expels the carbonic acid. This proceſs is improperly termed the burning of lime. The product is lime, or, as it is commonly called, quicklime.

If about half its weight of water be poured upon lime, a great increaſe of temperature takes place, ſteam is produced, and the lime crumbles down into a dry powder, ſomewhat increaſed in weight by the preſence of part of the water, which has been ſolidified by the lime: and to the caloric of fluidity, which is expelled during the converſion of the water into a ſolid, the great increaſe of the temperature is owing. Lime in this ſtate is ſaid to be ſlaked. If more water be poured upon ſlaked lime, there is no new evolution of caloric; but if the water amount to 700 times the weight of the lime, the lime is completely diſſolved. This ſolution is termed Lime-water.

As lime quickly attracts moiſture and carbonic acid from the atmoſphere, it ſhould be always recently prepared; and when kept, it ſhould be preſerved in very cloſe bottles. Lime ſhould not efferveſce with acids, and ſhould be entirely ſoluble in water.

Medical uſe.—On the living body lime acts as an eſcharotic, and as ſuch it was formerly applied to ill-conditioned and obſtinate ſores. Diſſolved in water, it is ſometimes given internally as a tonic or aſtringent in ſcrophula and various fluxes, and formerly it enjoyed conſiderable reputation as a lithontriptic.

Off. prep.—Aqua calcis, *Ed. Lond. Dub.* Aqua potaſſæ, *Ed. Lond. Dub.* Aqua ammoniæ, *Ed. Lond. Dub.*

CANCER. *Chelæ.* (*Lond.*) *Calculi oculi dicti; Chelæ.* (*Dub.*)
The crab. A genus of cruſtaceous inſects.

Sp. Cancer Astacus. *Lapilli. Ed.*
The craw-fiſh Crabs ſtones, vulgarly called Crabs eyes.

Crabs ſtones are generally about the ſize of peas, or larger; of a ſpherical ſhape, but a little flatted on one ſide; of a white colour; but ſometimes with a reddiſh or bluiſh caſt, and internally of a laminated ſtructure.

Theſe concretions are found in the ſtomach, one on each ſide, at the time when the crab changes its ſhell, and alſo renews the inner membrane of the ſtomach, which commonly happens in the month of Auguſt. They afterwards gradually diſappear, and no ſtones are found after the new ſhell has acquired its full degree of firmneſs. They therefore ſeem to furniſh the materials for the induration of the new ſhell. They are brought in great numbers from Poland and Ruſſia, eſpecially from the province of Aſtracan, where the craw-fiſh are either bruiſed with wooden mallets, or laid up in heaps to putrefy, when the fleſh is waſhed away with water, and the ſtones picked out.

They conſiſt of carbonate of lime, combined with a little phoſphate of lime and gelatine. The quantity of the two laſt is too ſmall, and their action on the living body too inconſiderable to make any conſiderable difference in medical properties, between theſe concretions and ſoft carbonate of lime, as it occurs in the mineral kingdom.

Crab ſtones are ſaid by moſt writers on the materia medica to be frequently counterfeited with tobacco-pipe clay, or compoſitions of chalk with mucilaginous ſubſtances. This piece of fraud, if really practiſed, may be very eaſily diſcovered; the counterfeits wanting the leafy texture which is obſerved upon breaking the genuine; more readily imbibing water; adhering to the tongue; and diſſolving in vinegar, or the ſtronger acids, diluted with water, either entirely, or not at all, or by piecemeal; whilſt the true crabs ſtones, digeſted in theſe liquors, become ſoft and tranſparent, their original form remaining the ſame, as the organization of the gelatine is not altered by the acid.

Off. prep.—Cancrorum lapilli præparati. *Ed.*

Sp. Cancer Pagurus. *Chelæ.* (*Ed.*)
The black-clawed crab. The claws.

This ſpecies of crab inhabits the ſea, and is found eſpecially in the North ſea. Its claws are yellow, tipt with black, and in every reſpect they reſemble the former article.

Off. prep.—Cancrorum chelæ ppt. *Lond. Dub.* Trochiſci cretæ, *Lond.* Pulv. chel. canc. comp. *Lond.*

CANELLA ALBA. *Cortex.* (*Lond. Ed. Dub.*)
Canella alba. The bark.
Willd. g. 942. *ſp.* 1. *Dodecandria Monogynia.*—Nat. ord. *Oleraceæ.*

The Canella alba, or, as the Dublin college name it, the Winterania canella, is a tall tree, which is very common in Jamaica, and other Weſt-India iſlands.

The canella is the interior bark, freed from an outward thin rough one, and dried in the ſhade. The ſhops diſtinguiſh two ſorts of canella, differing from each other in the length and thickneſs of the quills: they are both the bark of the ſame tree, the thicker being taken from the trunk, and the thinner from the branches.

It is brought to us rolled up in long quills, thicker than cinnamon, and both outwardly and inwardly of a whitiſh colour, lightly inclining to yellow. It is a warm pungent aromatic, not of the moſt agreeable kind; nor are any of the preparations of it very grateful. Infuſions of it in water are of a yellowiſh colour, and ſmell of the canella; but they are rather bitter than aromatic. Tinctures in rectified ſpirit have the warmth of the bark, but little of its ſmell. Proof ſpirit diſſolves the aromatic as well as the bitter matter of the canella, and is therefore the beſt menſtruum. It muſt not be confounded with the bark of the wintera aromatica.

Medical uſe.—Canella alba is often employed where a warm ſtimulant to the ſtomach is neceſſary, and as a corrigent of other articles. It is uſeful as covering the taſte of ſome other articles.

Off. prep.—Tinct. gent. comp. *Ed.*

CAPSICUM ANNUUM. *Fructus.* (*Ed.*) *Piper Indicum. Capſulæ.* (*Lond. Dub.*)

Cockſpur pepper. The pod.

Willd. g. 384. *ſp.* 1. *Pentandria Monogynia.*—Nat. ord. *Solonaceæ.*

THIS is an annual plant, a native of South America, but cultivated in large quantities in our Weſt-India iſlands; and it will even ripen its fruit in this climate.

The pods of this ſpecies are long, pointed, and pendulous, at firſt of a green colour, and afterwards of a bright orange red. They are filled with a dry looſe pulp, and contain many ſmall, flat, kidney-ſhaped ſeeds. The taſte of capſicum is extremely pungent and acrimonious, ſetting the mouth as it were on fire.

The pungency of cayenne pepper, I find, is ſoluble in water and in alcohol, is not volatile, reddens infuſions of turnſole, and is precipitated by infuſion of galls, nitrate of mercury, muriate of mercury, nitrate of ſilver, ſulphate of copper, ſulphate of zinc, red ſulphate of iron, (but not blue or green) ammonia, carbonate of potaſs, alum, but not by ſulphuric, nitric, or muriatic, acid, or ſilicized potaſs.

Cayenne pepper is an indiſcriminate mixture of the powder of the dried pods of many ſpecies of capſicum, but eſpecially of the capſicum frutefcens or bird pepper, which is the hotteſt of all. Cayenne pepper, as it comes to us from the Weſt-Indies, changes infuſion of turnſole to a beautiful green, probably owing to the muriate of ſoda, which is always added to it, and red oxide of lead, with which it is ſaid to be mixed.

Medical uſe.—Theſe peppers have been chiefly uſed as a condiment. They prevent flatulence from vegetable food, and have a warm and kindly effect in the ſtomach, poſſeſſing all the virtues of the oriental ſpices, without, according to Dr. Wright, producing thoſe complaints of the head which the latter are apt to occaſion. An abuſe of them, however, gives riſe to viſceral obſtructions, eſpecially of the liver. But of late they have been employed alſo in the practice of medicine. There can be little doubt that they furniſh us with one of the pureſt and ſtrongeſt ſtimulants which can be introduced into the ſtomach; while at the ſame time they have nothing of the narcotic effects of alcohol or opium. Dr. Adair Makitrick, who firſt introduced them into the practice of medicine, found them uſeful, particularly in that morbid diſpoſition which he calls *Cachexia Africana*, and which he conſiders as a moſt frequent and fatal prediſpoſition to diſeaſe among the ſlaves. Dr. Wright ſays, that in dropſical and other complaints, where chalybeates are indicated, a minute portion of powdered capſicum forms an excellent addition, and recommends its uſe in lethargic affections. This pepper has alſo been ſucceſsfully employed in a ſpecies of cynanche maligna, which proved very fatal in the Weſt Indies, reſiſting the uſe of Peruvian bark, wine, and the other remedies commonly employed. In tropical fevers, coma and delirium are common attendants; and in ſuch caſes, cataplaſms of capſicum have a ſpeedy and happy effect. They redden the parts, but ſeldom bliſter, unleſs when kept on too long. In ophthalmia from relaxation, the diluted juice of capſicum is a ſovereign remedy. Dr. Adair gave ſix or eight grains for a doſe, made into pills, or prepared a tincture, by digeſting half an ounce of the pepper in a pound of alcohol, the doſe of which was one or two drachms diluted with water.

CARBO LIGNI.

Charcoal of wood.

A place has been given to this ſubſtance, becauſe it is employed by the Edinburgh college in the preparation of the muriate of baryta, although it does not enter their liſt of materia medica.

Charcoal, as it is commonly prepared, is not a pure oxide of carbon, but contains alſo a notable proportion of hydrogen, from which it may be purified by expoſing it for ſome time to a ſtrong heat. Münch directs, that for medical uſe it be reduced to fine powder, and heated in a covered crucible as long as any flame appears on removing the cover, and until it be fully red. It is to be allowed to cool in the furnace, the upper layer of the powder to be removed, and the remainder to be ſealed accurately up in ounce vials.

Medical uſe.—When the pneumatic pathology was in faſhion, and phthyſis and ſimilar diſeaſes were aſcribed to hyper-oxygenation of the ſyſtem, charcoal was ſtrongly recommended as a powerful diſoxygenizing remedy, and caſes of its ſucceſsful employment are even recorded. From its acknowledged effects in correcting the putridity of animal ſubſtances, it is probable that the virtues aſcribed to it of preventing the putrid eructations which take place in ſome kinds of dyſpepſia are better founded. Ten grains may be given for a doſe. As an external application, powdered charcoal has been recommended in the cure of inflammation from external cauſes, gangrene, and all deſcriptions of fetid ulcers. The good effects of charcoal, or burnt bread, uſed as a tooth powder, in correcting the bad ſmell which the breath ſometimes acquires from carious teeth are undoubted.

Pharm. prep.—Murias barytæ, *Ed.* In this place it will not be ſuperfluous to notice the power aſcribed to charcoal of purifying various fetid or diſcoloured fluids. Lowitz found that it deſtroyed the adventitious colour and ſmell of vinegar, carbonate of ammonia, tartaric acid, alcohol, ſuper-tartrate of potaſs, and other ſalts, and that it prevented water from becoming putrid at ſea, eſpecially when aſſiſted by a little ſulphuric acid. Meat which has acquired a mawkiſh, or even putrid, ſmell, is alſo ſaid to be rendered perfectly ſweet by rubbing it with powdered charcoal.

CARBONAS.

Carbonate is a generic name for the combinations of the carbonic acid with earths, alkalies, and metallic oxides.

The nature of theſe ſubſtances was totally unknown, until the year 1756, when the genius of Dr. Black at once removed the veil, and diſplayed to his contemporaries a new and immenſe field, in which the moſt important diſcoveries might be made; and to their ardour in cultivating it, we are indebted for the preſent ſtate of chemical knowledge.

Before the brilliant epoch we have mentioned, the carbonates were ſuppoſed to be ſimple bodies; and the fact of their acquiring new and cauſtic properties by the action of fire, was attemped to be explained, by ſuppoſing that the particles of the fire combined with them. Dr. Black, however, demonſtrated by proofs which carried univerſal conviction along with them, that theſe bodies in their cauſtic ſtate are ſimple, and that their mildneſs is owing to their being combined with an acid, to which the name of carbonic is now given.

The moſt general character of the carbonates is, their efferveſcing violently when any of the ſtronger acids is poured upon them. This phenomenon is owing to theſe acids diſplacing, by their greater affinity, the carbonic acid, which flies off in the form of a gas.

The carbonates may be alſo deprived of their carbonic acid, either by the action of heat alone, or by heating them when mixed with charcoal, which decompoſes the carbonic acid by combining with part of its oxygen, ſo that both the acid and the charcoal are converted into carbonic oxide gas.

The carbonates may be divided into three great families, the alkaline, the earthy, and the metallic.

Family 1. The alkaline carbonates have a urinous taſte, tinge vegetable blues green, and are ſoluble in water, and inſoluble in alcohol.

Family 2. The earthy carbonates are inſipid, and inſoluble in water, but ſoluble in water ſaturated with carbonic acid.

Family 3. The metallic carbonates ſcarcely differ in appearance from the metallic oxides.

We ſhall have immediately occaſion to notice ſome individuals of each of theſe families.

CARBONAS BARYTÆ. (*Ed.*)

Carbonate of baryta.

Carbonated Baryta is rarely found in nature, and as it was firſt diſcovered by Dr. Withering, Mr. Werner gave it the name of Witherite. Its colour is greyiſh-white, ſometimes inclining to milk-white, and ſometimes with a ſlight tinge of yellow, from a mixture of iron, ſeldom greeniſh, often inveſted with a red ochry cruſt. It is found in ſolid maſſes, ſometimes filling an entire vein, ſometimes interſperſed with ſulphated baryta, frequently rounded or affecting that form, ſeldom cryſtallized. Texture, fibrous; fracture, conchoidal; fragments, long ſplinters; ſpecific gravity, 4.3 to 4.338. Although it has no ſenſible taſte, it is poiſonous. In medicine it is only uſed for preparing the muriate of baryta. It is found at Angleſark in Lancaſhire, at Alſtoon-moor in Cumberland, in Scotland, and in Sweden, but is not common.

According to different analyſes, its conſtituents are,

	Acid.		Baryta.		Water.
Withering,	20	+	80		
Pelletier,	22	+	62	+	16
Kirwan,	22	+	78		
Fourcroy,	10	+	90		

CARBONAS CALCIS. (*Ed.*) *Creta.* (*Lond. Dub.*)

Carbonated lime. Chalk.

This is the moſt common of all minerals, is found under a great variety of forms, and has various names, as chalk, limeſtone, marble, ſpar. In form it is either amorphous, ſtalactical, or cryſtallized. When amorphous, its texture is either foliated, ſtriated, granular, or earthy. The primitive form of its cryſtals is a rhomboidal parallelopiped. Hardneſs, luſtre, and tranſparency, various; when tranſparent, it cauſes double refraction; ſpecific gravity from 2.315 to 2.78; colour, when pure, white; effervesces violently with muriatic acid, and diſſolves entirely or nearly ſo in it, forming a colourleſs ſolution.

Its different varieties may be arranged under,

1. Soft carbonate of lime. Chalk.
2. Indurated carbonate of lime. Marble.

They contain about 45 parts of carbonic acid, and 55 of lime.

In medicine it is given to correct acidity in the primæ viæ, eſpecially when accompanied with looſeneſs. Powdered chalk has been externally applied with ſucceſs to ſcalds and burns.

In pharmacy it is employed for the preparation of carbonic acid gas, and of the muriate of lime.

Off. prep.—Aqua æris fixi, *Dub.* Aqua ſuper-carb. pot. *Ed. Dub.* Carbonas ammon. *Ed. Lond. Dub.* Aqua ſuper-carb. ammon. *Ed. Lond. Dub.* Carb. calcis, ppt. *Ed. Lond. Dub.* Solutio muriatis calcis, *Ed.* Potio carbonatis calcis, *Ed. Lond. Dub.* Trochiſci carb. calc. *Ed. Lond.*

CARBONAS POTASSÆ IMPURUS. (*Ed.*) *Cineres clavellati.* (*Lond. Dub.*)

Pearl aſhes. Potaſhes. Impure carbonate of potaſs.

The potaſhes of commerce are ſent to us from the ſhores of the Baltic and from America. They are prepared by lixiviating the aſhes of vegetables in barrels, firſt with cold and then with hot water, filtering the ley, and evaporating it to dryneſs in an iron pot. In this ſtate they ſtill contain ſome vegetable matter, not perfectly incinerated, which gives them a brown or black colour. To deſtroy this, and render their colour purer, they are again burnt in a reverberatory furnace. They now get the name of pearl aſhes; but even yet they are very impure, and often contain the ſulphates of potaſs and of lime, and the muriate of potaſs. They are alſo frequently adulterated with vegetable aſhes, ſand, and ſulphate of potaſs. The aſhes are detected by their difficult and imperfect ſolution; the ſand, by the precipitation of ſilica in a gelatinous form by the addition of an acid, and the ſulphate of potaſs by its cryſtallization. All vegetables which grow at a diſtance from the ſea afford potaſhes by incineration; herbs give the largeſt proportion, then the leaves of trees, then ſhrubs, and woods the leaſt. It formerly had the name of Fixed Vegetable Alkali, but it is alſo found, though much more ſparingly, both in the animal and mineral kingdoms.

Vauquelin has given a table of the quantity of pure potaſs, and of heterogenous matters, contained in 1152 parts of the different potaſhes of commerce.

	Potaſs.	Sulphate. of potaſs.	Muriate of potaſs.	Inſoluble reſiduum.	Carb. acid and water.
Ruſſian potaſhes,	772	65	5	56	254
American do.	857	154	20	2	119
Pearl aſhes,	754	80	4	6	308
Potaſhes of Treves,	720	165	44	24	199
Dantzick aſhes,	603	152	14	79	304
Potaſhes of Voſges,	444	148	510	34	304

The potaſs was eſtimated by the quantity of diluted nitrous acid ſaturated by it; the ſulphate of potaſs by the precipitate formed with nitrate of baryta; and the muriate of potaſs by that formed with nitrate of ſilver.

All theſe different potaſhes, except the laſt, may be purifiedficiently for pharmaceutical purpoſes, by lixiviating them with a ſmall proportion of cold water, and evaporating the ley to dryneſs in an iron pot.

Medical uſe.—Carbonate of potaſs is uſed in form of lotion, in rachitic and ſome cutaneous diſeaſes, and as a ſtimulant to the inactive ſtate of the veſſels in certain ulcers. It is uſed internally as a diaphoretic or diuretic, and of late in calculous complaints; but its continued uſe ſeldom fails to injure the conſtitution, or the inteſtinal canal.

Off. prep.—Carbonas potaſſæ, *Ed. Lond. Dub.* Alcohol ammoniat, *Ed. Lond. Dub.* Spirit ammon. fœtid, *Lond.*

CARBONAS SODÆ IMPURUS. (*Ed.*) *Barilla.* (*Lond. Dub.*)

Impure carbonate of ſoda. Barilla. Fixed mineral alkali.

Soda is a very common mineral production. It is the baſis of ſea ſalt; and combined with carbonic acid, it is found on the ſurface of the earth in Egypt, Syria, Barbary, Hungary, &c. and is obtained by the incineration of marine vegetables, eſpecially the ſalſola ſoda and kali, the ſalicornia herbacea, &c. The Spaniards even cultivate theſe in ſalt marſhes for the ſake of the ſoda. After being cut down, they are dried like hay. A deep pit is then prepared, and a bundle or two of the dried vegetables ſet on fire are thrown into it. When well kindled, other bundles are thrown in until the pit is filled. When the incineration is completed, the ſoda is found in the bottom, caked into a ſolid maſs, which is worked like a ſtony ſubſtance. When good, it is firm, hard, heavy, dry, ſonorous, ſpongy, and internally of a blue colour mixed with white ſpots, does not deliqueſce, emits no unpleaſant ſmell on ſolution, and does not leave a large proportion of inſoluble matter. Incinerated ſoda is mixed with potaſh, muriate of ſoda, and other ſaline matters; mineral ſoda with clay and other earthy ſubſtances. The Egyptian ſoda was reckoned the beſt; then the Spaniſh (Barilla); afterwards the Carthaginian; and that prepared from different ſpecies of fuci (kelp), is the worſt.

But all theſe carbonated ſodas are inferior in purity to thoſe now manufactured in Britain, by decompoſing the ſulphate of ſoda.

That commonly uſed, is obtained by the bleachers as a reſiduum in their method of preparing oxygenized muriatic acid, by decompoſing muriate of ſoda with ſulphuric acid and the black oxide of manganeſe.

The ſulphate of ſoda is decompoſed,

1. By carbonate of potaſs. Mr. Accum has deſcribed the manipulations of this mode. A boiling concentrated ſolution of about 560 pounds of American potaſhes is ladled into a boiling ſolution of 500 pounds of ſulphate of ſoda, agitated together, and the whole quickly heated to ebullition. It is then drawn off into leaden ciſterns, lined with thick ſheet-lead, and allowed to cool in a temperature which ſhould not exceed 55°.

   The fluid is then drawn off, and the maſs of ſalt waſhed with cold water, to free it from impurities, and again put into the boiler with clean water. This ſecond ſolution is alſo evaporated at a low heat, as long as any pellicles of ſulphate of potaſs form on its ſurface, and fall to the bottom of the fluid. The fire is then withdrawn, and the fluid ladled out into the ciſtern to cryſtallize. Unleſs the fluid be allowed to cool pretty low before it is removed to cryſtallize, the ſalt obtained will contain ſulphate of potaſs.
2. By acetate of lime. The acetous acid for this purpoſe is obtained by diſtillation from wood, during its converſion into charcoal.
3. By litharge or ſub-acetate of lead. Very pure carbonate of ſoda is prepared by this proceſs in the vicinity of Edinburgh.

4. By decompoſing the ſulphuric acid by charcoal. About 500 cwt. of ſulphate of ſoda, and 100 cwt. of charcoal are ground together, and the mixture expoſed in a reverberatory furnace until it becomes paſty. It is then transferred into large caſks, and lixiviated. The ley is afterwards evaporated and cryſtallized. By this or a ſimilar proceſs, very pure carbonate of ſoda is manufactured in the weſt of Scotland.

On the Continent, muriate of ſoda is ſometimes decompoſed by potaſs, and ſometimes by lime.

Carbonate of ſoda is an article of the greateſt importance in many manufactures.

Med. uſe.—In medicine, it poſſeſſes ſimilar virtues with the carbonate of potaſs; and from its cryſtallizability and efflorеſcence when expoſed to the air, it is preferable to it, becauſe its doſe may be more accurately aſcertained, and it may be given either in the form of powder, or made up into pills.

Off. prep.—Carbonas ſodæ, *Ed. Lond. Dub.*

CARDAMINE PRATENSIS. *Petala, folia.* (*Ed.*) *Cardamine. Flos.* (*Lond.*)

Ladies ſmock. The petals and leaves.

Willd. g. 1257. *ſp.* 19. *Tetradynamia Siliquoſa.*—Nat. ord. *Siliquoſæ.*

THE cardamine is a perennial plant, which grows in meadow-grounds, ſends forth purpliſh flowers in the ſpring; and in its ſenſible qualities reſembles the *ſiſymbrium naſturtium.*

Medical uſe.—Long ago it was employed as a diuretic; and of late it has been introduced in nervous diſeaſes, as epilepſy, hyſteria, choræa, aſthma, &c. A drachm or two of the powder is given twice or thrice a-day. It has little ſenſible operation, except that it ſometimes acts as a diaphoretic.

CARUM CARUI. *Semen.* (*Ed.*) *Carui. Semina.* (*Dub.*) *Caruon. Semen.* (*Lond.*)

Caraway. The ſeeds.

Willd. g. 561. *ſp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

CARAWAY is a biennial umbelliferous plant, cultivated with us in gardens, both for culinary and medicinal uſe. The ſeeds have an aromatic ſmell, and warm pungent taſte.

Med. uſe.—They are employed as a ſtomachic and carminative in flatulent colics and the like.

Off. prep.—Ol. volat. *Lond. Dub.* Spiritus, *Ed. Lond. Dub* Decoct. anth. nob. *Ed.* Tinct. cardamomi, comp. *Lond. Dub.* Tinct. ſen. *Lond. Dub.* Confect. opiat, *Lond.* Emplaſt cumini..

CASSIA.

Willd. g. 813. *Decandria Monogynia.*—Nat. ord. *Lomentaceæ.*

Sp. 18. CASSIA FISTULA. *Fructus.* (*Ed.*) *Caſſia fiſtularis. Fructus.* (*Lond.*) *Fructus, pulpa.* (*Dub.*)

Caſſia tree. The fruit.

THIS tree is indigenous in India and Egypt, and is cultivated in Jamaica. It riſes to about thirty feet high, and has long flower ſpikes, with yellow papilionaceous bloſſoms.

Its fruit is a cylindrical pod, ſcarcely an inch in diameter; a foot or more in length: the outſide is a hard brown bark; the inſide is divided by thin tranſverſe woody plates, covered with a ſoft black pulp, of a ſweetiſh taſte, with ſome degree of acrimony. There are two ſorts of this drug in the ſhops; one brought from the Eaſt Indies, the other from the Weſt, (Caſſia Javanica ?) the canes or pods of the latter are generally large, rough, thick-rinded, and the pulp nauſeous; thoſe of the former are leſs, ſmoother, the pulp blacker, and of a ſweeter taſte; this ſort is preferred to the other. Such pods ſhould be choſen as are weighty, new, and do not make a rattling noiſe (from the ſeeds being looſe within them) when ſhaken. The pulp ſhould be of a bright, ſhining, black colour, and have a ſweet taſte, neither harſh, which happens from the fruit being gathered before it has grown fully ripe, nor ſouriſh, which it is apt to become upon keeping, nor at all mouldy, which, from its being kept in damp cellars, or moiſtened, in order to increaſe its weight, it is very ſubject to be. Greateſt part of the pulp diſſolves both in water and in alcohol; and may be extracted from the pod by either. The ſhops employ water, boiling the bruiſed pod therein, and afterwards evaporating the ſolution to a due conſiſtence.

Med. uſe.—The pulp of caſſia, from its ſaccharine and extractive conſtituents, is a gentle laxative medicine, and is frequently given, in a doſe of ſome drachms, in coſtive habits. Some direct a doſe of two ounces or more as a cathartic, in inflammatory caſes, where the more acrid purgatives are improper; but in theſe large quantities it generally excites nauſea, produces flatulencies, and ſometimes gripings of the bowels, eſpecially if the caſſia be not of a very good kind: theſe effects may be prevented by the addition of aromatics, and by exhibiting it in a liquid form.

Off. prep.—Pulpa expreſſa, *Ed. Lond.* Elect. *Ed. Lond. Dub.* Elect. ſennæ, *Ed. Lond.*

Sp. 24. CASSIA SENNA. *Folia.* (*Ed.*) *Senna. Folia.* (*Lond. Dub.*)

Senna. The leaves.

THIS ſpecies of caſſia is annual, although in its mode of growth it reſembles a ſhrub, and ſends out hollow woody ſtems, to the height of four feet. It grows principally in Upper Egypt, from whence the leaves are brought, dried, and picked from the ſtalks, to Alexandria in Egypt, and thence imported into Europe. They are of an oblong figure, ſharp-pointed at the ends, about a quarter of an inch broad, and not a full inch in length, of a lively, yellowiſh, green, colour, a faint, not very diſagreeable, ſmell, and a ſubacrid, bitteriſh, nauſeous taſte. Some inferior ſorts are brought from other places: theſe may eaſily be diſtinguiſhed by their being either narrower, longer, and ſharper pointed, from Mocha; or larger, broader, and round pointed, with ſmall prominent veins, from Italy; or large and obtuſe, of a freſh green colour, without any yellow caſt, from Tripoli.

It has been cuſtomary to reject the pedicles of the leaves of ſenna, as cauſing gripes and pains in the bowels; but this is a mere prejudice, for both leaves and pedicles act in the very ſame way. Neumann from 480 parts of ſenna got 143 alcoholic extract, and afterwards 140 watery; and inverſely, 245 watery, and only 28 alcoholic, ſo that it ſeems to conſiſt chiefly of mucilage and extractive.

Medical uſe.—Senna is a very uſeful cathartic, operating mildly, and yet effectually; and, if judiciouſly doſed and managed, rarely occaſioning the ill conſequences which too frequently follow the exhibition of the ſtronger purges. The only inconveniences complained of in this drug are, its being apt to gripe, and its nauſeous flavour.

Theſe are beſt obviated by adding to the ſenna ſome aromatic ſubſtance, as ginger, cinnamon, &c. and by facilitating its operation by drinking plentifully of any mild diluent.

Senna may be given in ſubſtance to the extent of about a drachm, but it is rather too bulky, and it is therefore better to divide it into two dozes, and to take the one half at night, and the other in the morning. It is more conveniently given in the form of infuſion, which is generally made by pouring about ſix ounces of boiling water upon from two to ſix drachms of ſenna leaves in a tea-pot, and letting it ſtand about an hour. Senna ought never to be ordered in decoction, Gren ſays, becauſe it becomes perfectly inert from the total diſſipation of the nauſeous and volatile principle on which its purgative effects depend. The tincture, on account of the menſtruum, cannot be given in doſes large enough to purge.

Off. prep.—Infuſum ſennæ, *Lond. Dub.* Inf. ſennæ tart. *Lond.* Inf. tamarindi cum ſenna, *Ed.* Syrupus mannæ, *Dub.* Tinct. ſenn. comp. *Ed. Lond. Dub.* Elect. *Ed. Lond. Dub.* Extract, *Ed. Lond. Dub.* Pulv. comp. *Lond.*

CASTOR FIBER. *Materia in folliculis prope anum collecta* (*Ed.*) *Caſtoreum Roſſicum.* (*Dub.*) *Materia in folliculo prope anum ſito collecta.* (*Lond.*)

The Beaver. Caſtor. The ſubſtance collected in the follicles near the anus.—*Mammalia rodentia;* Cuvier.

THE beaver is ſtrongly characterized by its flat, horizontal, ſcaly tail. It is an amphibious animal, and is found in the northern parts of Europe, Aſia, and America, on the banks of lakes and rivers. In inhabited countries it is a ſolitary ſlothful animal, but in deſert regions it lives in ſociety; the remarkable manners of which, and the immenſe works effected by the united labours of all the individuals of their republic, have rendered the natural hiſtory of this animal familiar to every one. In both ſexes, between the anus and pudendum, there are four follicles of an oblong ſhape, ſmaller above and larger below, formed of a tough membrane, almoſt reſembling leather. The two largeſt and undermoſt of theſe, which are alſo connected, and lie parallel and cloſe to each other, contain an oily fluid ſecretion, which is the ſubſtance known by the name of caſtor. It is preſerved by cutting out the entire bags, and drying them in the ſmoke.

The beſt caſtor comes from Ruſſia, Pruſſia, and Poland. The cods ſhould be dry, gibbous, roundiſh, heavy, ſolid, and filled with a ſolid ſubſtance, contained in membranous cells, ſomewhat tough, but brittle, of a dark brown colour, of a peculiar, diſagreeable, narcotic ſmell, and a nauſeous, bitter, acrid taſte. The Canadian caſtor is of an inferior quality; the cods are ſmaller, thin, oblong, and much corrugated, and the caſtor itſelf has much leſs ſmell and taſte: what is very old, quite black, and almoſt deſtitute of ſmell and taſte, is unfit for uſe, as well as the counterfeited caſtor, which is a mixture of various gummy reſins and other ſubſtances, with a little real caſtor, artificially interſperſed with membranes, and ſtuffed into the ſcrotum of a goat. This impoſition is eaſily detected by the weaker degree of its ſmell and taſte, by chemical analyſis, and even by mere external examination; for to the real bags, the two ſmaller and upper follicles, filled with a fatty matter, are always attached.

Neumann got from 480 parts of caſtor 140 alcoholic extract, and afterwards 80 watery; inverſely, 140 watery, and 20 alcoholic. The firſt alcoholic extract retained the whole flavour of the caſtor, as none of it roſe in diſtillation with the alcohol. The diſtilled water, on the contrary, contained the whole flavour, and the watery extract was merely bitter. Cartheuſer obtained from it a volatile oil by diſtillation.

Med. uſe.—Caſtor is an excellent antiſpaſmodic. It is very little heating, and acts particularly upon the uterine ſyſtem.

It is given with advantage,

1. In typhoid fevers.
2. In ſpaſmodic diſeaſes, eſpecially in hyſteria and epilepſy, and in caſes of difficult parturition, from a ſpaſmodic contraction of the mouth of the uterus after the membranes have burſt.
3. In amenorrhœa.

It is exhibited moſt advantageouſly in the form of powder, in doſes of from 10 to 20 grains, and in clyſters to a drachm. Diluted alcohol extracts its virtues; therefore it may be alſo given in the form of tincture. But its exhibition in the form of extract or decoction is improper.

Off. prep.—Tinct. *Ed. Lond. Dub.*

CENTAUREA BENEDICTA. *Herba.* (*Ed.*) *Carduus Benedictus. Herba.* (*Lond.*) *Folia.* (*Dub.*)

Bleſſed Thiſtle. The leaves or plant.

Syngeneſia Polygamia fruſtranea.—Nat. ord. *Compoſitæ capitatæ.*

THIS is an annual plant, indigenous in the Grecian iſlands, and cultivated in gardens: it flowers in June and July, and perfects its ſeeds in the autumn. The herb ſhould be gathered when in flower, quickly dried, and kept in a very dry airy place, to prevent its rotting or growing mouldy, which it is very apt to do. The leaves have a penetrating bitter taſte, not very ſtrong or very durable, accompanied with an ungrateful flavour, from which they are in a great meaſure freed by keeping. Water extracts, in a little time, even without heat, the lighter and more grateful parts of this plant; if the digeſtion be continued for ſome hours, the diſagreeable parts are taken up. A ſtrong decoction is very nauſeous and offenſive to the ſtomach. Rectified ſpirit gains a very pleaſant bitter taſte, which remains uninjured in the extract.

Neumann got from 1920 parts 270 alcoholic, and afterwards 390 watery extract, and inverſely 600 watery and 60 alcoholic.

The virtues of this plant ſeem to be little known in the preſent practice. The nauſeous decoction is ſometimes uſed to provoke vomiting; and a ſtrong infuſion to promote the operation of other emetics. But this elegant bitter, when freed from the offenſive parts of the herb, may be advantageouſly applied to other purpoſes. Excellent effects have been frequently experienced from a ſlight infuſion of carduus in loſs of appetite, where the ſtomach was injured by irregularities. A ſtronger infuſion made in cold or warm water, if drunk freely, and the patient kept warm, occaſions a plentiful ſweat, and promotes the ſecretions in general.

The extract prepared, by evaporating the expreſſed juice, with the addition of a little alcohol to prevent it from becoming mouldy, has been ſtrongly recommended in the catarrh of children.

The ſeeds of this plant are alſo conſiderably bitter, and have been ſometimes uſed with the ſame intention as the leaves.

CEPHAELIS IPECACUANHA.

Ipecacuanha. Radix. (*Lond. Ed. Dub.*)
Ipecacuan. The root.
Willd. g. 357. *ſpecies nova.—Pentandria Monogynia.*—Nat. ord. *Aggregatæ.*

This plant is perennial, and grows in Brazil in moiſt woody ſituations. Notwithſtanding the root has been ſo long in general uſe, the plant to which it belonged was not ſatisfactorily aſcertained until very lately, when a complete monography of it, and an excellent plate were publiſhed in the ſixth volume of the Tranſactions of the Linnæan Society, by Profeſſor Brotero, who calls it the Callicocca Ipecacuanha; but the genus Callicocca has been united by Willdenow with that of Cephaelis, to which we have therefore referred it.

The plate of Brotero correſponds with that publiſhed in Woodville's Medical Botany, vol. 3, from a plant ſent in ſpirits from Brazil by Governor Philips to Sir Joſeph Banks, but which unfortunately was not in flower, and alſo with the rude draught of Piſo, who firſt examined it. In likewiſes agrees in many eſſential characters, though not in all, with the deſcription given of the Pſychotria Emetica of Dr. Mutis. Indeed, the genera of Pſychotria and Cephaelis are not ſufficiently diſtinguiſhed.

The root is brought from Spaniſh America. It is divided into two ſorts, Peruvian and Brazilian: but the eye diſtinguiſhes three, aſh-coloured or grey, brown, and white. The aſh-coloured, or Peruvian ipecacuan of the ſhops, is a ſmall wrinkled root, bent and contorted into a great variety of figures, brought over in ſhort pieces full of wrinkles, and deep circular fiſſures, quite down to a ſmall white woody fibre that runs in the middle of each piece: the cortical part is compact, brittle, looks ſmooth and reſinous upon breaking: it has very little ſmell; the taſte is bitteriſh and ſubacrid, covering the tongue as it were with a kind of mucilage. The brown ipecacuan is ſmall, and ſomewhat more wrinkled than the foregoing; its bark is of a brown or blackiſh colour without, and white within; this is brought from Brazil, and is the root of the cephaelis. The white ſort is woody, has no wrinkles, and no perceptible bitterneſs in taſte. It is probably the root of a viola. The firſt ſort, the aſh-coloured or grey ipecacuan, is that uſually preferred for medicinal uſe. The brown has been ſometimes obſerved, even in a ſmall doſe, to produce violent effects. The white, though taken in a large one, has ſcarce any effect at all.

Ipecacuan was firſt brought into Europe about the middle of laſt century, and an account of it publiſhed about the ſame time by Piſo; but it did not come into general uſe till about the year 1686, when Helvetius, under the patronage of Lewis XIV, introduced it into practice. This root is one of the mildeſt and ſafeſt emetics with which we are acquainted; and has this peculiar advantage, that when it does not operate by vomiting, it paſſes off by other emunctories.

Neumann got from 7680 parts 1440 alcoholic, and afterwards 1880 watery extract, and inverſely 2400 watery, and 600 alcoholic. I find that the tincture of Ipecacuan does not redden infuſion of lithmus, that it is precipitated by water, after which it does not precipitate a ſolution of gelatine, but is precipitated by red ſulphate of iron, and readily acquires a green colour from exceſs of the chalybeate, and precipitates infuſion of gall nuts. Dr. Irvine aſcertained that the watery ſolution is much more powerfully emetic than the alcoholic; that the cortical is more active than the ligneous part; and that the whole root poſſeſſes conſiderable influence, both as an antiſeptic and aſtringent; that the diſtilled water has very little influence; but that the decoction which remained in the ſtill, operated violently as an emetic, produced rigours, cold ſweats, and other alarming ſymptoms; that by long-continued boiling, the activity of the root is almoſt totally deſtroyed; and that the emetic property of ipecacuan was moſt effectually counteracted by means of the acetous acid, inſomuch that thirty grains of the powder taken in two ounces of vinegar, produced only ſome looſe ſtools.

From theſe experiments it evidently appears, that ipecacuan contains cinchonin and a reſin, and that its emetic property does not depend upon the latter, although we can ſcarcely attribute it to the former, as in other ſubſtances it does not manifeſt any emetic property. It is therefore probably owing to ſome other principle ſoluble in water and alcohol. Others have found, that the reſinous part is more apt to act upon the inteſtinal canal, and to operate by ſtool.

Medical uſe.—The primary effect of ipecacuan is that of ſtimulating the ſtomach. If the doſe be ſufficiently large, it excites vomiting, by inverting the periſtaltic motion of the ſtomach and duodenum; in a ſmaller doſe, it only produces nauſea, and operates by ſtool; and in ſtill ſmaller doſes, it gently ſtimulates the ſtomach, increaſes the appetite, and facilitates digeſtion. Its ſecondary effects depend on the ſympathy of other parts with the ſtomach; and in this way only can we explain its action as an antiſpaſmodic, diaphoretic, expectorant, and in checking hæmorrhagies. Its beneficial effects in ſome caſes alſo ſeem to be owing to the general concuſſion given to the whole ſyſtem during the action of vomiting.

Ipecacuan, properly adminiſtered, often proves ſerviceable,

1. In intermittent fevers. It has frequently ſucceeded in ſtopping theſe, when given about an hour before an acceſſion was expected, and alſo when given ſo as to produce vomiting at the time of an acceſſion, or at the end of the cold ſtage.
2. In continued fevers. We have never ſeen more decidedly beneficial effects from the uſe of any medicine whatever, than from the exhibition of ipecacuan in the commencement of typhus fever. An emetic, ſucceeded by a diaphoretic regimen, when adminiſtered ſufficiently early in this diſeaſe, very frequently cuts it ſhort at once, and when it fails in this deſirable object, it always has a beneficial influence on the progreſs of the fever.
3. In inflammatory diſeaſes, rheumatiſm, bubo, ſwelled teſticle.
4. In exanthematous diſeaſes, when the eruption is diſpoſed to recede.
5. In hæmorrhagies, when given in nauſeating doſes.
6. In profluvia, eſpecially in dyſentery, ſo much ſo, that it was formerly eſteemed a ſpecific againſt that diſeaſe. But Cullen attributes its good effects in this inſtance to its producing a ſteady determination of the periſtaltic motion of the inteſtines downwards, when given in repeated ſmall doſes.
7. In many ſpaſmodic diſeaſes; in epilepſy; aſthma; dyſpnœa; pertuſſis; chronic diarrhœa; hyſteria; melancholia; mania.
8. In cachectic diſeaſes, as in ſome kinds of dropſy.
9. In impetiginous diſeaſes; in jaundice.
10. In local diſeaſes; in amauroſis, and ſeveral of the dyſorexiæ.
11. Laſtly, in every inſtance when we wiſh to evacuate the ſtomach, as when it is overloaded with food, or when poiſon, eſpecially opium, has been ſwallowed.

The uſe of ipecacuan, as an emetic, is contraindicated,

1. Where there is a diſpoſition to hæmorrhagy.
2. Where there is an increaſed flow of blood towards the head.
3. In very irritable ſubjects.
4. In pregnant women, and perſons afflicted with hernia.

Ipecacuan is exhibited

1. In ſubſtance; in powder. Full vomiting will generally be produced in an adult by a ſcruple or half a drachm, and though leſs might anſwer the purpoſe, fortunately an over doſe is ſcarcely attended with any inconvenience, as the whole of it is vomited with the contents of the ſtomach as ſoon as it operates. The vomiting is promoted and facilitated by drinking copiouſly of warm watery fluids. On the contrary, when vomiting is not intended, liquids muſt be rather drunk ſparingly, and the doſe muſt be diminiſhed to a grain or leſs. In ſuch ſmall doſes it is conveniently combined with any proper adjunct, in the form of powder, pill, or bolus.
2. In infuſion. One drachm may be infuſed in four ounces of water, and taken in repeated doſes till it operate.
3. Infuſed in wine.

Ipecacuan not only checks the narcotic effects of opium, and is therefore one of the beſt antidotes for its poiſon, but reciprocally the emetic powers of ipecacuan are checked by the addition of opium, and the combination operates by increaſing the cuticular diſcharge.

Off. prep.—Vinum Ip. *Ed. Lond. Dub.* Pulv. Ip. and opii, *Ed. Lond. Dub.*

CERA FLAVA. (*Ed. Lond. Dub.*)

Yellow wax.

For this uſeful ſubſtance we are indebted to the common honey bee, (*apis mellifica*), an inſect belonging to the claſs of *Hymenoptera mellita* of Cuvier. It is, however, a vegetable production, and is collected by the bees from the ſurface of leaves, and the antheræ of flowers. They employ it to form the combs in which the honey and larvæ are depoſited.

It is found in the ſhops in round cakes, which are formed by melting the combs, after all the honey has been expreſſed from them, in hot water. The wax ſwims above, and the impurities either ſink to the bottom, or are diſſolved in the water. When recent, it is tenacious, but brittle, of a yellow colour, and ſweet honey-like ſmell; dry, not greaſy, to the feel; inſoluble in water, alcohol and ether; ſoluble in the fat oils and alkalies; fuſible and inflammable. In ſelecting it, we ſhould obſerve that the cakes be brittle, have a pleaſant yellow colour, an agreeable ſmell, no taſte, do not adhere to the teeth when chewed, and burn entirely away. When adulterated with reſin, the fraud is detected by its taſte, and the action of alcohol, which diſſolves the reſin. When mixed with peaſe meal or earthy ſubſtances, it is more brittle, of a paler colour, and may be ſeparated from them by liquefaction and ſtraining. When combined with tallow, it becomes leſs brittle, but at the ſame time ſofter, and has an unpleaſaut ſmell.

Pharm. prep.—Oxidum antim. vitrif. cum cera, *Ed.* Ungt. reſ. flav. *Lond. Dub. Ed.* Cerat. res. flav. *Lond. Dub.* Emplaſt. ceræ, *Lond. Dub. Ed.* Ungt. picis, *Ed.* U. picis, burgund. *Lond. Dub.* Emplaſt. cumini, *Lond.* Ungt. inf. mel. veſic, *Ed.* Empt. mel. veſ. *Ed.* Emp. mel. ves. comp. *Ed.* Emp. aſſæ foet. *Ed.* Empl. gummos, *Ed.* Cer. ſaponis, *Lond. Dub.* Cer. lith. acet. comp. *Lond. Dub.* Cer. lap. calam. *Lond. Dub.* Empl. oxidi ferri rubri, *Ed.*

CERA ALBA. (*Lond. Dub. Ed.*)
White wax.

THE yellow colour of bees wax, and its peculiar ſmell, may be deſtroyed by the combined action of water, air, and the ſun's rays. In the proceſs for bleaching wax, we, therefore, extend its ſurface as much as poſſible, by melting it and forming it into thin plates, which are fully expoſed to the ſun's rays, upon linen ſtretched in frames, and repeatedly moiſtened, until they acquire the whiteneſs deſired. It is then uſually melted into thin diſcs. White wax is more brittle, leſs fuſible, and heavier than yellow wax. It is ſometimes mixed with white oxide of lead, or with tallow. For medical uſe, it has no advantage over yellow wax.

Medical uſe.—When taken internally, wax agrees in its effects with the fat oils, and though leſs frequently preſcribed in this way, it is preferable, it being leſs apt to become rancid. Poerner recommends it as an excellent remedy in diſeaſes of the inteſtines, attended with pain, excoriation, and obſtinate diarrhœa. He gave a ſcruple, or half a drachm of wax, three or four times a-day, in the form of an emulſion, by melting it firſt with ſome fixed oil, and then mixing it with a decoction of groats by trituration with the yolk of an egg. But by far its principal uſe is for the formation of cerates, ointments, plaſters, &c.

Off. prep.—Linam. ſimp. *Ed.* Ung. ſimp. *Ea.* Ung. ſperm. ceti, *Lond. Dub.* Ung. ceræ, *Lond. Dub.* Cerat. ſimp. *Ed.* Cerat. ſper. ceti, *Lond. Dub.* Ung. ceruſſæ acet. *Lond. Dub.*

CERVUS ELAPHUS. *Cornu.* (*Ed.*) *Cornu Cervinum.* (*Dub.*) *Cervus. Cornu.* (*Lond.*)
The ſtag or hart. The horns.

THIS animal belongs to the claſs *mammalia*, order *ruminantia.* The male has two round ſolid horns on his forehead, with ſeveral conical branches, the number of which aſcertain the age of the animal to which they belong. Theſe horns fall off and are renewed every year. When firſt reproduced, they are ſoft, full of blood veſſels, and covered with a velvety ſkin, but they ſoon loſe their covering, and become hard, compact, and bony.

In their nature they do not ſeem to differ from bone except in containing a larger proportion of cartilage. They afford a very conſiderable quantity of gelatine by decoction with water, and hartſhorn ſhavings are ſtill employed in domeſtic economy for furniſhing a nutritious and demulcent jelly. By the action of fire, their products are the ſame with thoſe of animal ſubſtances in general; and they were formerly ſo much uſed for the preparation of ammonia, that it was commonly called Hartſhorn. By burning they are totally converted into phoſphate of lime.

Off. prep.—Liquor volat. ſal, et oleum, cornu cervi, *Lond. Dub.* Cornu cervi uſt. *Lond. Dub.* Oxidum antimon. cum phoſphat. calcis, *Ed. Lond. Dub.*

CHIRONIA CENTAUREUM. *Gentiana Centaureum. Summitatis florentes.* (*Ed.*) *Centaureum minus. Summitates florentes.* (*Dub.*) *Cacumen.* (*Lond.*)

Smaller Centaury. The flowering heads.

Willd. g. 394. *ſp.* 9. *Pentandria Monogynia.*—Nat. ord. *Rotaceæ.*

THIS plant is annual, and grows wild in many parts of England on barren paſtures. It flowers between June and Auguſt. The corolla is ſaid to have no taſte; and therefore the herb, which is intenſely bitter, ſhould be preferred to the flowering tops, which derive their virtues only from the ſtalks connected with them. It agrees in every reſpect with other pure bitters.

Neumann got from 480 parts 210 alcoholic, and 140 watery extract, and inverſely 320 watery, and 40 alcoholic.

CINCHONA.

Willd. g. 346. *Pentandria Monogynia.*—Nat. ord. *Contortæ.*

Sp. 1. CINCHONA OFFICINALIS. *Cortex.* (*Ed.*)

Cinchona. Cortex. (*Lond.*) *Cortex Peruvianus.* (*Dub.*)

Officinal Cinchona. The bark, commonly called Peruvian bark, of which the Edinburgh College enumerates three varieties,

a. The common,
b. The yellow,
c. The red.

It is, however, by no means aſcertained, that the two laſt are the bark of the cinchona officinalis, but have been merely claſſed under it until we are better acquainted with their botanical hiſtory.

The cinchona officinalis grows in the neighbourhood of Loxa, a city in the province of Quito, in the kingdom of Peru. It is a mountainous tree, and is never found in the plains. It grows to a great height, and formerly its trunk was often thicker than a man's body. But ſince its bark has come into ſuch general uſe, few trees are to be ſeen thicker than a man's arm. Indeed, there is reaſon to fear, that it will become ſtill more ſcarce, as no attention is paid to its cultivation, and the trees always die after being ſtripped of their bark. This operation is performed in the dry ſeaſon, from September to November. The bark is then carefully dried in the ſun, and packed in ſkins, which contain from 100 to 150 pounds, and are called by the Spaniards zeronne. In theſe, coarſe and fine pieces of the ſame kind of bark are promiſcuouſly mixed, but they are afterwards ſorted.

1. Common pale bark.

In commerce we find ſeveral varieties of the common pale bark, the moſt remarkable of which come from Loxa, the quilled bark, and from Guanaco, the flat bark.

The bark which comes from Loxa conſiſts of thin ſingly or doubly rolled pieces, a fingers length or more, and ſcarcely a line in thickneſs; externally rough, of a greyiſh brown colour, and generally covered with a kind of lichen; internally of a cinnamon colour. Its fracture ſhould not be fibrous or powdery, but even and ſhining. It has a peculiar aromatic ſmell, and a pleaſant, bitter, aſtringent taſte.

The bark which comes from Guanaco conſiſts of much thicker, coarſer, and flatter, pieces; externally of a dark brown or almoſt black colour, but internally it has the ſame cinnamon colour, and in its reſinous fracture, ſmell, and taſte, it exactly reſembles the former. When genuine, both varieties are excellent remedies, although the former be generally preferred on the Continent, and the latter in Britain.

The great price of Peruvian bark has ſometimes tempted diſhoneſt men to adulterate it with other ſimilar and leſs powerful barks, and, what is ſtill more blameable, with genuine bark, from which the active conſtituents have been entirely extracted by decoction with water.

In ſelecting Peruvian bark, we muſt therefore ſee, that, beſides the characteriſtics already noticed, it be denſe, heavy, and dry, not muſty or ſpoiled by moiſture, and that a decoction made of it have a reddiſh colour when warm, but when cold become paler, and depoſite a browniſh red ſediment. Thoſe pieces whoſe taſte is ſimply intenſely bitter or very aſtringent, or nauſeous, or merely mucilaginous, whoſe ſurface is ſmooth or poliſhed, of a dark colour, or pale yellow, or red, which are tough or ſpongy, whoſe fracture is fibrous, woody, or powdery, and their internal colour white or grey, are to be rejected.

There are few vegetable ſubſtances which have been ſo much ſubjected to analyſis as the Peruvian bark, and yet our knowledge of it is extremely imperfect. Neumann got from 7680 parts 640 alcoholic, and afterwards 300 watery extract, and inverſely 336 watery, and 600 alcoholic. Lewis obſerved that the decoction became turbid on cooling, but aſcribed this to the ſeparation of reſin, which he ſuppoſed had been melted out by the heat. He alſo aſcertained that the bitterneſs remained diſſolved while the aſtringency reſided chiefly in this precipitate, and that the precipitate was ſoluble in alcohol. In his experiments chalybeate ſolutions ſtruck a deep green with the decoction of bark. Dr. Irving, however, remarked that recent preparations of bark ſtruck a black colour, while thoſe which had been kept ſome time became green. Seguin's diſcovery at laſt enabled chemiſts to aſcertain the aſtringency of different ſubſtances with more preciſion; and Dr. Maton and Mr. Davy found that Peruvian bark contained very little tannin. Seguin next diſcovered that ſolutions of bark were precipitated by tannin, and therefore concluded that it contained gelatine. This opinion, however, I proved to be erroneous, by finding that the principle which formed the precipitate with tannin, was ſoluble in alcohol; and as in its properties it did not coincide with any other which had hitherto been deſcribed, I gave it the name of Cinchonin. Tincture of cinchona is precipitated by water, the precipitate is eaſily ſeparated by filtration, the filtered ſolution is copiouſly precipitated by infuſion of gall nuts, and ſlightly by ſolution of gelatine. With a very ſmall proportion of red ſulphate of iron, it acquires a purpliſh colour, with a ſomewhat larger proportion, a black, which, on the ſlighteſt further addition of the chalybeate, becomes a full green. The different colours produced by different proportions of the chalybeate account for the different reſults obtained by Dr. Lewis and Dr. Irving, and prove, from the green colour which the latter obſerved in experiments with old preparations, while the recent ones ſtruck a black, that the principle on which the change of colour depends is exceedingly deſtructible. In the filtered decoction, infuſion of galls produced a pulverulent, and ſolution of gelatine a copious, filamentous precipitate.

The principles therefore proved to exiſt in Peruvian bark, ſeem to be cinchonin, tannin, an acid, (the gallic ?) and a matter precipitable from the tincture by water, (a reſin ?) Its aroma has alſo been proved to depend on a very minute proportion of volatile oil.

Medical uſe.—On dead animal matter it acts as an antiſeptic, and on the living body it acts moreover as a ſtimulant, tonic, and antiſpaſmodic. The diſcovery of its medical virtues was, in all probability, the reſult of accident; and in fact, according to ſome, the Peruvians learned the uſe of the bark by obſerving certain animals affected with intermittents inſtinctively led to it; while others ſay, that a Peruvian having an ague, was cured by happen-ing to drink of a pool which, from ſome trees having fallen into it, taſted of cinchona; and its uſe in gangrene is ſaid to have originated from its curing one in an aguiſh patient. About the year 1640, the lady of the Spaniſh viceroy, the Comitiſſa del Cinchon, was cured by the bark, which was therefore called Cortex or Pulvis Comitiſſæ, Cinchona, &c.; and from the intereſt which Cardinal de Lugo and the Jeſuit fathers took in its diſtribution, Cortex or Pulvis Cardinalis de Lugo, Jeſuiticus, Patrum, &c.; from the place of its growth Peruvian bark, or ſimply, from its pre-eminence, Bark.

On its firſt introduction into Europe, it was reprobated by many eminent phyſicians; and at different periods long after, it was conſidered a dangerous remedy; but its character, in proceſs of time, became very univerſally eſtabliſhed.

It was firſt introduced for the cure of intermittent fevers; and in theſe, when properly exhibited, it rarely fails of ſucceſs. Practitioners, however, have differed with regard to the beſt mode of exhibition; ſome prefer giving it juſt before the fit, ſome during the fit, others immediately after it. Some, again, order it between the fits; the doſe being the more frequent and larger according to their frequency; and this mode of exhibition, although it may perhaps ſometimes lead to the employment of more bark than is neceſſary, upon the whole appears preferable, from being beſt ſuited to moſt ſtomachs. The requiſite quantity is very different in diffent caſes; and in many vernal intermittents it ſeems even hardly neceſſary.

It is now given, from the very commencement of the diſeaſe, without previous evacuations, which, with the delay of the bark, or under doſes of it, by retarding the cure, often ſeem to induce abdominal inflammations, ſcirrhus, jaundice, hectic, dropſy, &c. ſymptoms formerly imputed to the premature or intemperate uſe of the bark, but which are beſt obviated by its early and liberal uſe. It is to be continued not only till the paroxyſms ceaſe, but till the natural appetite, ſtrength, and complexion return. Its uſe is then to be gradually left off, and repeated at proper intervals to ſecure againſt a relapſe; to which, however unaccountable, there often ſeems to be a peculiar diſpoſition; and eſpecially when the wind blows from the eaſt. Although, however, evacuation rather counteracts the effects of the Peruvian bark in intermittents, yet it is of advantage, previous to its uſe, to empty the alimentary canal, particularly the ſtomach; and on this account good effects are often obtained from premiſing an emetic.

It is a medicine which ſeems not only ſuited to both formed and latent intermittents, but to that ſtate of fibre on which all rigidly periodical diſeaſes ſeem to depend; as periodical pain, inflammation, hæmorrhagy, ſpaſm, cough, loſs of external ſenſe, &c.

Bark is now uſed by ſome in all continued fevers; at the ſame time attention is paid to keep the bowels clean, and to promote when neceſſary, the evacuation of redundant bile, always, however, ſo as to weaken the patient as little as poſſible.

In confluent ſmall-pox, it promotes languid eruption and ſuppuration, diminiſhes the fever through the whole courſe of it, and prevents or corrects putreſcence and gangrene.

In gangrenous ſore throats it is much uſed, as it is externally and internally in every ſpecies of gangrene.

In contagious dyſentery, after due evacuation, it has been uſed, taken internally and by injection, with and without opium.

In all thoſe hæmorrhagies called paſſive, and which it is allowed all hæmorrhagies are very apt to become, and likewiſe in other increaſed diſcharges, it is much uſed; and in certain undefined caſes of hæmoptyſis, ſome allege that it is remarkably effectual when joined with an abſorbent.

It is uſed for obviating the diſpoſition to nervous and convulſive diſeaſes; and ſome have great confidence in it, joined with ſulphuric acid, in caſes of phthiſis, ſcrofula, ill-conditioned ulcers, rickets, ſcurvy, and in ſtates of convaleſcence. In theſe caſes, it is proper to conjoin it with a milk diet.

In dropſy, not depending on any particular local affection, it is often alternated or conjoined with diuretics or other evacuants, and by its early exhibition after the water is once drawn off, or even begins to be freely diſcharged, a freſh accumulation is prevented, and a radical cure obtained.

Mr. Pearſon of the Lock Hoſpital praiſes very highly the powers of this remedy in different forms of the venereal diſeaſe; in reducing incipient bubo, in cleanſing and healing ulcers of the tonſils, and in curing gangrenous ulcers from a venereal cauſe. But in all theſe caſes mercury muſt alſo be given to eradicate the venereal virus from the ſyſtem.

Peruvian bark may be exhibited,

1. In ſubſtance.

The beſt form of exhibiting this valuable remedy is in the ſtate of a very fine powder, in doſes of from ten grains to two drachms and upwards. As it cannot be ſwallowed in the form of a dry powder, it muſt either be diffuſed in ſome liquid, as water, wine, or milk, or mixed with ſome viſcid ſubſtance, as currant jelly. Its taſte, which is diſagreeable to many people, is beſt avoided by taking it immediately after it is mixed up; for by ſtanding any time, it is communicated to the vehicle. In this reſpect, therefore, it is better for the patients to mix it up themſelves, than to receive it from the apothecary already made up into a draught with ſome ſimple diſtilled water, or into an electuary with a ſyrup. A much more important objection to this form of giving Peruvian bark is, that ſome ſtomachs will not bear it, from the oppreſſion, and even vomiting, which in theſe caſes it excites. We muſt endeavour to obviate this inconvenience by the addition of ſome aromatic, and by giving it in ſmall doſes more frequently repeated. If we are unable to ſucceed by theſe means, we muſt extract the moſt active conſtituents of the bark by means of ſome menſtruum. It has therefore long been a pharmaceutical problem to diſcover which menſtruum extracts the virtues of Peruvian bark moſt completely. But the active conſtituents of this remedy, according to the beſt and lateſt analyſis, are cinchonin, tannin, and gallic acid, combined with ſome mucilage and reſin. Of theſe the two laſt are not ſoluble in any one menſtruum; but they moſt probably contribute very little to the powers of the medicine. The three other conſtituents, on the contrary, on which all its activity depends, taken ſingly, are all of them very ſoluble, both in water and in alcohol, and in every mixture of theſe. But it would be contrary to analogy to ſuppoſe, that theſe ſubſtances ſhould exiſt ſo intimately mixed as they muſt be in an organic product, without exerting upon each other ſome degree of chemical affinity, and forming combinations poſſeſſed of new properties. Accordingly we find, whether it ariſe from this cauſe, or merely from the ſtate of aggregation, that neither water nor alcohol extract theſe conſtituents from Peruvian bark in the ſame quantity in which they are able to diſſolve them ſeparately, and that we muſt have recourſe to direct experiment to determine the degree of action poſſeſſed by each menſtruum upon it. With this view many experiments have been made, and by very able chemiſts. But moſt of them were performed when the ſcience of chemiſtry was but in its infancy; and even at this time that branch of it which relates to theſe ſubſtances is ſo little underſtood, that the reſults of the lateſt experiments are far from concluſive.

2. In infuſion.

To thoſe whoſe ſtomachs will not bear the powder, this is the beſt form of exhibiting Peruvian bark. Water, at a given temperature, ſeems capable of diſſolving only a certain quantity, and therefore we are not able to increaſe the ſtrength of an infuſion, either by employing a larger quantity of the bark, or allowing them to remain longer in contact. One part of bark is ſufficient to ſaturate ſixteen of water in the courſe of an hour or two. To accelerate the action of the water, it is uſual to pour it boiling hot upon the bark, to cover it up, and allow it to cool ſlowly. After ſtanding a ſufficient length of time, the infuſion is decanted off for uſe. The infuſion in water is however liable to one very great objection, that it cannot be kept even a very ſhort time without being decompoſed and ſpoiled. Therefore, in ſome inſtances, we prepare the infuſion with wine; and it fortunately happens that very often the uſe of the menſtruum is as much indicated as that of the ſolvend.

3. In tincture.

The great activity of the menſtruum in this preparation, prevents the bark from being given in ſufficiently large doſes to exert its peculiar virtues. It is, however, a powerful ſtimulant.

4. In decoction.

Water of the temperature of 212° is capable of diſſolving a much larger proportion of the ſoluble parts of Peruvian bark than water at 60°. But the ſolvent powers even of boiling water have their limits, and by protracting the decoction we do not increaſe its ſtrength, but rather, by diminiſhing the quantity of the menſtruum, we leſſen the quantity of matter diſſolved. Beſides, at a boiling temperature, ſome of the active conſtituents abſorbs oxygen rapidly from the atmoſphere, and is converted into what ſeems to be an inſoluble and inert reſinous ſubſtance.

5. In extract.

In this preparation we expect to poſſeſs the virtues of Peruvian bark in a very concentrated ſtate. The principal objections to its uſe are its great expence, and the decompoſition and deſtruction of the active conſtituents of the bark during the preparation, when not properly conducted. It is convenient for the formation of pills and boluſes, but we would always prefer a freſh infuſion or decoction to any mixture in which the extract is rediſſolved.

Externally, Peruvian bark is uſed in ſubſtance, as an application to ill-conditioned, carious, or gangrenous ulcers.

In the form of clyſter, it may be given in ſubſtance, decoction, or extract. The powder is uſed as a tooth powder for ſpongy and bleeding gums, and the decoction is an excellent aſtringent gargle or waſh.

To increaſe the power of Peruvian bark, or to direct its efficacy to a particular purpoſe, or to correct ſome inconveniences occaſionally produced by it, it is frequently combined with other remedies. When it produces vomiting, carbonic acid forms a uſeful addition; when it purges, opium; when it oppreſſes the ſtomach, aromatics; and when it induces coſtiveneſs, rhubarb. But we are afraid that many additions are made, chiefly ſaline ſubſtances, of which the effects are not at all underſtood. Sulphuric acid, ſuper-ſulphate of alumina and potaſs (alum), muriate of ammonia, carbonate of potaſs, tartrate of potaſs, tartrate of antimony and potaſs (tartar emetic), iron, lime-water, aſtringents, &c. have been frequently preſcribed with it; but we know that in many of theſe mixtures decompoſition occurs, which renders the whole either inactive, or completely deceives us with regard to the expected effects.

2. Yellow Peruvian bark.

This kind of bark has only been introduced ſince 1790, and we are ſtill uncertain, both with regard to the tree which produces it, and the place of its growth. It conſiſts of pieces about ſix inches in length, thicker, and leſs rolled up than the common bark. Its internal ſurface is of a deeper red. It ſometimes wants the epidermis, which is often as thick as the bark itſelf. It is lighter and more friable than the former variety; its fracture is fibrous; and when reduced to powder, its colour is paler. Its taſte is much more bitter, aſtringent, and ſtronger, but its ſmell is weaker. Its decoction when hot is redder, but when cold, paler. Its ſolutions ſtrike a deeper colour with ſulphate of iron. It contains more of the active conſtituents than either of the others, but leſs gum than the common, and leſs reſin than the red. It alſo produces the ſame effects in much ſmaller doſes. The epidermis ſhould always be removed before it is powdered.

3. Red Peruvian bark occurs generally in much larger, thicker, flatter pieces, but ſometimes alſo in the form of quills. It is heavy, firm, ſound, and dry; friable between the teeth; does not ſeparate into fibres; and breaks, not ſhivery, but ſhort, cloſe, and ſmooth. It has three layers: the outer is thin, rugged, of a reddiſh brown colour, but frequently covered with moſſy matter; the middle is thicker, more compact, darker coloured, very reſinous, brittle, and yields firſt to the peſtle: the inmoſt is more woody, fibrous, and of a brighter red. Its powder is reddiſh, like that of Armenian bole.

Its aſtringency and bitterneſs are more intenſe, and it contains more reſin than the pale bark. It alſo produces its effects in ſmaller doſes. It is ſaid to be more frequently adulterated.

Off. prep.—Infuſ. *Ed. Dub.* Decoct. *Ed. Lond. Dub.* Tinctura, *Ed. Lond. Dub.* Tinct. comp. *Lond. Dub.* Tinct. ammon. *Lond.* Extract, *Ed.* E. molle, *Lond. Dub.* E. durum, *Lond. Dub.* E. cum reſina, *Lond.* Vin. gent. comp. *Ed.*

Sp. 4. CINCHONA CARIBÆA. *Cortex.* (*Ed.*)

Cinchona of the Caribæan iſlands. The bark.

THIS tree is found in the Caribæan iſlands. It grows to a very large ſize. Dr. Wright, to whom we are indebted for all our knowledge of it, found ſome in the pariſh of St. James's, Jamaica, fifty feet high, and proportionally thick. The wood is hard, clouded, and takes a fine poliſh. The bark of the large trees is rough, the cuticle thick and inert, and the inner bark thinner than that of the young trees, but more fibrous. The bark is brought to us in pieces about a ſpan in length, rolled together, and a line or half a line in thickneſs, of a brown colour on the ſurface, which is moſt commonly covered with white lichens: internally it is of a dark brown colour, and very fibrous in its fracture. It has at firſt a ſweetiſh taſte, but after being chewed ſome time it becomes extremely nauſeous and bitter. Dr. Wright ſays he made uſe of this bark in all caſes where Peruvian bark was indicated, and with the greateſt ſucceſs. It has often been confounded with the cinchona floribunda (Willdenow's 7th ſpecies), ſo excellently analyſed by Fourcroy under the title of the Cinchona of St. Domingo, and which taken internally, is apt to excite vomiting and purging.

CISSAMPELOS PAREIRA. *Pareira Brava. Radix.* (*Lond. Dub.*)

Pareira brava. The root.

Dioecia Monadelphia.—Nat. ord. *Sarmentaceæ.*

THIS is a perennial climbing plant, which grows in the Weſt-India iſlands, and in South America. The root, which is officinal, is brought to us from Brazil, in pieces of different ſizes, ſome no bigger than one's finger, others as large as a child's arm; it is crooked, and variouſly wrinkled on the ſurface; outwardly of a dark colour, internally of a dull yellowiſh, and interwoven with woody fibres; ſo that, upon a tranſverſe ſection, a number of concentric circles appear, croſſed with fibres, which run from the centre to the circumference: It has no ſmell; the taſte is a little bitteriſh, blended with a ſweetneſs like that of liquorice. Neumann got from 480 parts 123 alcoholic, and 60 watery extract, and inverſely 140 watery, and 66 alcoholic. Nothing roſe in diſtillation.

Medical uſe.—This root is highly extolled by the Americans and Portugueſe, in a great variety of diſeaſes, particularly againſt ſuppreſſions of urine, nephritic pains, and calculus. Geoffroy alſo found it uſeful in nephritic diſorders, in ulcers of the kidneys and bladder, in humoral aſthmas, and in ſome ſpecies of jaundice. The common people of Jamaica uſe a decoction of the roots for pains and weakneſs of the ſtomach, proceeding from relaxation. The doſe of the root in ſubſtance is from twelve grains to half a drachm; in decoction to two or three drachms.

CISTUS CRETICUS. *Ladanum. Reſina.* (*Lond.*)

Cretan Ciſtus. Ladanum. A reſin.

Willd. g. 1048. *ſp.* 13.—Nat. ord. *Aſcyroideæ.*

This is a perennial ſhrub which grows in Syria, and more eſpecially in the Grecian iſlands.

This reſin is ſaid to have been formerly collected from the beards of goats who browſed the leaves of the ciſtus: at preſent, a kind of rake, with ſeveral ſtraps or thongs of ſkins fixed to it, is drawn lightly over the ſhrub, ſo as to take up the unctuous juice, which is afterwards ſcraped off with knives. It is rarely met with pure, even in the places where it is produced; the duſt, blown upon the plant by the wind, mingling with the viſcid juice, and the inhabitants alſo being ſaid to mix it with a certain black ſand. In the ſhops two ſorts are met with: the beſt (which is very rare) is in dark-coloured almoſt black maſſes, of the conſiſtence of a ſoft plaſter, which grows ſtill ſofter upon being handled; of a very agreeable ſmell, and of a light, pungent, bitteriſh taſte: the other ſort is harder, not ſo dark-coloured, in long rolls coiled up: this is of a much weaker ſmell than the firſt, and has a large admixture of a fine ſand, which in the ladanum examined by the French academy, made up three fourths of the maſs; and that found in the ſhops ſeems even more ſandy. What Neumann examined, however, gave him 5400 alcoholic, and 480 watery, and inverſely 960 watery, and 4960 alcoholic, extract from 7680 parts. In diſtillation water carries over a volatile oil, and alcohol diſtilled from it becomes milky on the addition of water.

Off. prep.—Emplaſt. lad. comp. *Lond.* E. picis burgund. *Lond.*

CITRUS.

Polyadelphia Icoſandria.—Nat. ord. *Pomaceæ.*

Sp. Citrus Aurantium. *Folia, flores, aqua ſtillatitia et oleum volatile florum, fructûs ſuccus, fructus immaturus, et cortex exterior, (Ed.) Aurantium Hiſpalenſe. Folium, flos, fructûs ſuccus, et cortex exterior. (Lond.) Fructûs ſuccus et cortex exterior, fructus immaturus, florum aqua ſtillatitia. (Dub.)*

Seville orange. The leaves, flowers, diſtilled water, and eſſential oil of the flowers, the juice and outer rind of the fruit, and the unripe fruit.

The orange tree is a beautiful evergreen, a native of Aſia, but now abundantly cultivated in the ſouthern parts of Europe and in the Weſt-India iſlands. There are ſeveral varieties of this ſpecies, but they may be all referred to the bitter or Seville orange, and the ſweet or China orange.

The leaves are neither ſo aromatic nor ſo bitter as the rind of the fruit.

The flowers (flores naphæ) are highly odoriferous, and have been for ſome time paſt in great eſteem as a perfume; their taſte is ſomewhat warm, accompanied with a degree of bitterneſs. They yield their flavour by infuſion to rectified ſpirit, and in diſtillation both to ſpirit and water, (aqua florum naphæ): the bitter matter is diſſolved by water, and, on evaporating the decoction, remains entire in the extract.

A very fragrant red-coloured oil, diſtilled from theſe flowers, is brought from Italy under the name of *oleum* or *eſſentia neroli;* but oil of behen, in which orange flowers have been digeſted, is frequently ſubſtituted for it. The fraud, however, is eaſily detected, as the real oil is entirely volatile, and the adulterated is not.

The juice of oranges is a grateful acid liquor, conſiſting principally of citric acid, ſyrup, extractive, and mucilage.

The outer yellow rind of the fruit is a grateful aromatic bitter.

The unripe fruit dried are called Curaçoa oranges. They vary in ſize from that of a pea to that of a cherry. They are bitterer than the rind of ripe oranges, but not ſo aromatic, and are uſed as a ſtomachic.

Medical uſe.—The leaves have been celebrated by eminent phyſicians as a powerful antiſpaſmodic in convulſive diſorders, and eſpecially in epilepſy; with others they have entirely failed. Orange flowers were at one time ſaid to be an uſeful remedy in convulſive and epileptic caſes; but experience has not confirmed the virtues attributed to them. As by drying they loſe their virtues, they may be preſerved for this purpoſe by packing them cloſely in earthen veſſels, with half their weight of muriate of ſoda. The juice is of conſiderable uſe in febrile or inflammatory diſtempers, for allaying heat, quenching thirſt, and promoting the ſalutary excretions: it is likewiſe of uſe in genuine ſcorbutus, or ſea-ſcurvy. Although the Seville, or *bitter orange* as it is called, has alone a place in our pharmacopœias, yet the juice of the China, or ſweet orange, is much more employed. It is more mild, and leſs acid; and it is uſed in its moſt ſimple ſtate with great advantage, both as a cooling medicine, and as an uſeful antiſeptic in fevers of the worſt kinds, as well as in many other acute diſeaſes, being highly beneficial as alleviating thirſt. Dr. Wright applied the roaſted pulp of oranges as a poultice to fetid ſores in the Weſt Indies, with very great ſucceſs.

The rind proves an excellent ſtomachic and carminative, promoting appetite, warming the habit, and ſtrengthening the tone of the viſcera. Orange-peel appears to be conſiderably warmer than that of lemons, and to abound more with eſſential oil: to this circumſtance, therefore, due regard ought to be had in the uſe of theſe medicines. The flavour of the firſt is likewiſe ſuppoſed to be leſs periſhable than that of the other.

Off. prep. of the rind.—Syr. cort. aurantii, *Lond. Dub.* Aq. deſtil. *Ed.* Spiritus raph. comp. *Lond. Dub.* Tinctura cort. A. *Lond.*

Dub. Tinct. cinch. comp. *Lond. Dub.* Tinct. gent. comp. *Ed.* Conſerva cort. A. *Ed. Lond. Dub. Of the juice.*—Succ. coch. comp. *Lond. Ed.*

Sp. CITRUS MEDICA. *Fructus, cortex fructûs, et ejus oleum volatile.* (*Ed.*) *Limon. Succus, cortex exterior, et oleum eſſentia dictum.* (*Lond.*) *Succus, cortex exterior, ejuſdemque oleum eſſentiale.* (*Dub.*)

Lemon tree. The juice and outer rind, and its eſſential oil, of the fruit.

THE juice of lemons is ſimilar in quality to that of oranges, from which it differs little otherwiſe than in containing more citric acid and leſs ſyrup. The quantity of the former is indeed ſo great, that the acid has been named from this fruit, Acid of Lemons, and is commonly prepared from it. The ſimple expreſſed juice will not keep, on account of the ſyrup, extractive, and mucilage, and quantity of water which it contains, which cauſes it to ferment.

It was therefore extremely deſirable that an eaſy method ſhould be diſcovered of reducing it to ſuch a ſtate that it would not ſpoil by keeping, and would be leſs bulky.

Various means have been propoſed and practiſed with this view. The juice has been evaporated to the conſiſtence of rob; but this always gives an empyreumatic taſte, and does not ſeparate the extractive or mucilage, ſo that it is ſtill apt to ferment when agitated on board of ſhip in tropical climates. It has been expoſed to froſt, and part of the water been removed under the form of ice; but this is liable to all the former objections, and beſides, where the lemons are produced in ſufficient quantity, there is not a ſufficient degree of cold. The addition of a quantity of alcohol to the inſpiſſated juice ſeparates the mucilage, but not the extractive or ſugar. By means, however, of Scheele's proceſs, as reduced to determinate quantities by Prouſt, we can obtain the acid perfectly pure and cryſtallized.

To 94 parts of lemon juice, 4 parts of carbonate of lime are to be added: the carbonic acid is ſeparated by efferveſcence, and a quantity of inſoluble citrate of lime is precipitated. By evaporating the ſupernatant liquor, another portion of citrate of lime is obtained. Theſe added together amount to about 7½ parts, and require 20 parts of ſulphuric acid, of the ſpecific gravity of 1.15, to decompoſe them. The ſulphate of lime, being nearly inſoluble, is precipitated, while the citric acid remains in ſolution, and is to be ſeparated by waſhing, and cryſtallized by evaporation. If too much ſulphuric acid be added, when the liquor is much concentrated, it reacts upon the citric acid, and chars a portion of it. When this is the caſe, a little chalk muſt be added.

By this, or ſome ſimilar proceſs, it is now manufactured in this country, in large quantities, and ſold under the name of Coxwell's Concrete Salt of Lemons.

The yellow peel is an elegant aromatic, and is frequently employed in ſtomachic tinctures and infuſions: it is conſiderably leſs hot than orange-peel, and yields in diſtillation with water a leſs quantity of eſſential oil: its flavour is nevertheleſs more periſhable, yet does not ariſe ſo readily with ſpirit of wine; for a ſpiritous extract made from lemon-peel poſſeſſes the aromatic taſte and ſmell of the ſubject in much greater perfection than an extract prepared in the ſame manner from the peels of oranges.

Citric acid is a powerful and agreeable antiſeptic. Its powers are much increaſed, according to Dr. Wright, by ſaturating it with muriate of ſoda. The mixture he recommends as poſſeſſing very great efficacy in dyſentery, remittent fever, the belly-ach, putrid ſore throat, and as being perfectly ſpecific in diabetes and lienteria. Citric acid is often uſed with great ſucceſs for allaying vomiting: with this intention it is mixed with carbonate of potaſs, from which it expels the carbonic acid with efferveſcence. This mixture ſhould be drunk as ſoon it is made: or the carbonic acid gas, on which actually the anti-emetic powers of this mixture depends, may be extricated in the ſtomach itſelf, by firſt ſwallowing the carbonate of potaſs diſſolved in water, and drinking immediately afterwards the citric acid properly ſweetened. The doſes are about a ſcruple of the carbonate diſſolved in eight or ten drachms of water, and an ounce of lemon juice, or an equivalent quantity of citric acid.

Lemon juice is alſo an ingredient in many pleaſant refrigerant drinks, which are of very great uſe in allaying febrile heat and thirſt. Of theſe, the moſt generally uſeful is lemonade, or diluted lemon-juice, properly ſweetened. Lemonade, with the addition of a certain quantity of any good ardent ſpirit, forms the well-known beverage punch, which is ſometimes given as a cordial to the ſick. The German writers order it to be made with arrack, as rum and brandy, they ſay, are apt to occaſion headach. But the fact is directly the reverſe, for, of all ſpirits, arrack is moſt apt to produce headach. The lighteſt and ſafeſt ſpirits are thoſe which contain leaſt eſſential oil, or other foreign matters, and which have been kept the longeſt time after their diſtillation.

Off. prep. of the rind.—Aq. deſt. *Ed.* Spt. ammon. comp. *Ed. Lond. Dub.* *Of the juice.*—Syr. citr. med. *Ed. Lond. Dub.* Succ. ſpiſſat. *Lond.* *Of the oil.*—Ungt. ſulph, *Ed.* Ungt. helleb. alb. *Lond. Dub.*

COCCUS CACTI. (*Ed.*) *Coccinella.* (*Lond.*)
Cochineal.

COCHINEAL is the dried body of the female of a hemipterous inſect. It is found only in Mexico, and is nouriſhed entirely on the leaves of the opuntia or nopal, (cactus coccinelliferus). The wild cochineal, which is covered with a ſilky envelope, is leſs valuable than the cultivated cochineal, which is without that covering; but grows to a larger ſize, and furniſhes a finer and more permanent colour. The Spaniards endeavour to confine both the inſect and the plant on which it feeds to Mexico. But this attempt at monopoly will, we hope, be fruſtrated by the exertions of ſome gentlemen in the Eaſt-Indies. The male only is furniſhed with wings, the female has none, and remains conſtantly attached to the leaf of the cactus. During winter, the Mexicans preſerve theſe inſects, with the ſucculent leaves to which they are attached, in their houſes. In ſpring, after the rainy ſeaſon is over, they are transferred to the living plants, and in a few days they lay innumerable eggs, and die. They are collected three times in the year: firſt the dead mothers are gathered as ſoon as they have laid their eggs; in three or four months, the young which have grown to a ſufficient ſize are collected; and in three or four months more, all the young are collected, large and ſmall indiſcriminately, except thoſe which they preſerve for breeding next year. They are killed by incloſing them in a bag and dipping them in hot water, and by expoſing them on iron plates to the heat of the fire. 800,000 pounds are brought annually to Europe; and each pound contains at leaſt 70,000 inſects. From their appearance, when brought to us, they were long ſuppoſed to be the ſeed of ſome plant. They are ſmall, irregular, roundiſh bodies, of a blackiſh-red colour on the outſide, and a bright purple red within. Their taſte is acrid, bitteriſh, and aſtringent. They are uſed only for the ſake of the fine colour which they produce, and they are principally conſumed by the ſcarlet dyers. In pharmacy they are employed to give a beautiful red to ſome tinctures. Their colour is eaſily extracted, both by alcohol, water, and water of ammonia; and in the dried inſect it is not impaired by keeping for any length of time.

Neumann got from 1920 grains 1440 watery extract, and in another experiment from the ſame quantity 1430 alcoholic. The former was extremely gelatinous.

Off. prep.—Tinct. card. comp. *Lond. Dub.* Tinct. ariſt. ſerp. *Ed.* Tinct. cinchon. comp. *Lond.* Tinct. gent. comp. *Ed.* Tinct. helleb. *Ed. Lond. Dub.* Tinct. canth. *Lond.*

COCHLEARIA.

Willd. g. 1228. *Tetradynamia Siliculoſa.*—Nat. ord. *Siliquoſæ.*

Sp. 1. COCHLEARIA OFFICINALIS. *Herba.* (*Ed.*) *Cochlearia. Herba.* (*Dub.*) *Cochlearia hortenſis. Herba.* (*Lond.*)

Garden ſcurvy-graſs. The plant.

This is an annual plant, which grows on the ſea-ſhore of the northern countries of Europe, and is ſometimes cultivated in gardens. As long as it is freſh it has a peculiar ſmell, eſpecially when bruiſed, and a kind of ſaline acrid taſte, which it loſes completely by drying, but which it imparts by diſtillation to water or alcohol. It alſo furniſhes an eſſential oil, the ſmell of which is ſo ſtrong as to make the eyes water.

Med. uſe.—The freſh plant is a gentle ſtimulant and diuretic, and is chiefly uſed for the cure of ſea-ſcurvy. It is employed externally as a gargle in ſore throat, and ſcorbutic affections of the gums and mouth. It may be eaten in ſubſtance in any quantity, or the juice may be expreſſed from it, or it may be infuſed in wine or water, or its virtues may be extracted by diſtillation.

Off. prep.—Succus coch. comp. *Lond. Ed.* Spirit raph. comp. *Lond. Dub.*

Sp. 8. Cochlearia Armoracia. *Radix.* (*Ed.*) *Raphanus ruſticanus. Radix.* (*Lond. Dub.*)

Horſe-radiſh. The root.

This perennial plant is ſometimes found wild about river-ſides, and other moiſt places: for medicinal and culinary uſes, it is cultivated in gardens; it flowers in June, but rarely perfects its ſeeds in this country. Horſe-radiſh root has a quick pungent ſmell, and a penetrating acrid taſte; it nevertheleſs contains in certain veſſels a ſweet juice, which ſometimes exudes upon the ſurface. By drying, it loſes all its acrimony, becoming firſt ſweetiſh, and afterwards almoſt inſipid: if kept in a cool place, covered with ſand, it retains its qualities for a conſiderable time.

Medical uſe.—This root is an extremely-penetrating ſtimulus. It excites the ſolids, and promotes the fluid ſecretions; it ſeems to extend its action through the whole habit, and affects the minuteſt glands. It has frequently done ſervice in ſome kinds of ſcurvies and other chronic diſorders, proceeding from a viſcidity of the juices, or obſtructions of the excretory ducts. Sydenham recommends it likewiſe in dropſies, particularly thoſe which ſometimes follow intermittent fevers. Both water and rectified ſpirit extract the virtues of this root by infuſion, and elevate them in diſtillation: along with the aqueous fluid, an eſſential oil ariſes, poſſeſſing the whole taſte and pungency of the horſe-radiſh.

3840 parts, according to Neumann, were reduced by drying to 1000, and gave of watery extract 480, and 15 of alcoholic, and inverſely 420 alcoholic, and 480 watery; all theſe extracts were ſweetiſh, without pungency. About 15 of volatile oil, extremely pungent, and heavier than water, aroſe in diſtillation with water.

Off. prep.—Spirit. raph. comp. *Lond. Dub.*

COCOS BUTYRACEA. *Oleum nucis fixum.* (*Ed.*)

The mackaw tree. The fixed oil of the nut, commonly called Palm Oil.

Palmæ.—Nat. ord. *Palmæ.*

THIS tree is a native of South America. The fruit is triangular, yellow, and as big as a plumb. The nut or kernel yields the oleum palmæ of the ſhops. It is firſt ſlightly roaſted and cleaned, and then ground to a paſte, firſt in a mill, then on levigating ſtone. This paſte is gently heated, and mixed with $\frac{3}{16}$ its weight of boiling water put into a bag, and the oil expreſſed between two heated plates of iron. It yields $\frac{7}{16}$ or ^{8} of oil. If coloured, this oil may be purified by filtration when melted. This oil has the conſiſtence of butter, a golden yellow colour, the ſmell of violets, and a ſweetiſh taſte. When well preſerved, it keeps ſeveral years without becoming rancid. When ſpoiled, it loſes its yellow colour and pleaſant ſmell. It is ſaid to be often imitated with axunge, coloured with turmeric, and ſcented with Florentine iris root. It is rarely uſed in medicine, and only externally as an emollient ointment.

COLCHICUM AUTUMNALE. *Radix.* (*Ed.*) *Colchicum. Radix.* (*Lond. Dub.*)

Meadow ſaffron.

Willd. g. 707. *ſp.* 1. *Hexandria Trigynia.*—Nat. ord. *Liliaceæ.*

MEADOW SAFFRON is a perennial, bulbous-rooted plant, which grows in wet meadows in the temperate countries of Europe. It flowers in the beginning of autumn, at which time the old bulb begins to decay, and a new bulb to be formed. In the following May the new bulb is perfected, and the old one waſted and corrugated. They are dug for medical uſe in the beginning of ſummer. The ſenſible qualities of the freſh root are very various, according to the place of growth, and ſeaſon of the year. In autumn it is inert; in the beginning of ſummer highly acrid: ſome have found it to be a corroſive poiſon, others have eaten it in conſiderable quantity without experiencing any effect. When it is poſſeſſed of acrimony, this is of the ſame nature with that of garlic, and is entirely deſtroyed by drying.

Medical uſe.—Störk, Collin, and Plenk, have celebrated its virtues as a diuretic in hydrothorax and other dropſies. But it is at beſt a very uncertain remedy. The expreſſed juice is uſed in Alſace to deſtroy vermin in the hair.

Off. prep.—Syr. colch. autumn. *Ed.* Oxymel colchici, *Lond.*

COLOMBA. (*Lond. Ed.*) *Columbo.* (*Dub.*)

Colomba. The root.

THIS is the root of an unknown plant, which, however, is conjectured by Willdenow to be a ſpecies of bryonia. It was ſuppoſed to have its name from a city in Ceylon, from which it is ſent over all India. But more recent accounts ſay, that it is produced in Africa, in the country of the Caffres, and that it forms an important article of commerce with the Portuguеſe at Mozambique, in the province of Tranquebar. It is generally brought in tranſverſe ſections, from half an inch to three inches in diameter, rarely divided horizontally. This is evidently done to facilitate its drying, for the large pieces are all perforated with holes. The bark is wrinkled and thick, of a dark brown colour on the outſide, and bright yellow within. The pith in the centre is ſpongy, yellowiſh, and ſlightly ſtriped. Its ſmell is ſlightly aromatic, and readily loſt when not preſerved in cloſe veſſels; its taſte is unpleaſant, bitter, and ſomewhat acrid; the bark has the ſtrongeſt taſte; the pith is almoſt mucilaginous. Its eſſential conſtituents are cinchonin, and a great deal of mucilage. It is accordingly more ſoluble in water than in alcohol. The tincture is not precipitated by water, and does not affect the colour of infuſion of turnſol, or ſolution of red ſulphate of iron.

Medical uſe.—In India it is much uſed in diſeaſes attended with bilious ſymptoms, particularly in cholera; and it is ſaid to be ſometimes very effectual in other caſes of vomiting. It often produces excellent effects in dyſpepſia. Half a drachm of the powder is given repeatedly in the day. Its introduction into practice in this country has been chiefly owing to Dr. Percival of Mancheſter, and it has in general been found to anſwer expectation: but it is to be regretted, that it is often exhibited in a very decayed ſtate, from the want of a regular ſupply.

Off. prep.—Tinct. *Ed. Lond. Dub.*

CONIUM MACULATUM. *Folia, Semen.* (*Ed.*) *Cicuta. Herba, flos, ſemen.* (*Lond.*) *Herba, ſemina nondum matura.* (*Dub.*)

Hemlock. The leaf, flower, and ſeed.

Willd. g. 533. *ſp.* 1.—*Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

THIS is a large biennial umbelliferous plant, which grows very commonly about the ſides of fields, under hedges, and in moiſt ſhady places. As it may eaſily be confounded with other plants of the ſame natural order, which are either more virulent, or leſs active, we ſhall give a full deſcription of its botanical characters. The root is white, long, of the thickneſs of a finger, contains when it is young a milky juice, and reſembles both in ſize and form the carrot. In ſpring it is very poiſonous, in harveſt leſs ſo. The ſtalk is often three, four, and even ſix feet high, hollow, ſmooth, not beſet with hairs, and marked with red or brown ſpots. The leaves are large, and have long and thick foot-ſtalks, which, at the lower end, aſſume the form of a groove, and ſurround the ſtem. From each ſide of the foot-ſtalk other foot-ſtalks ariſe, and from theſe a ſtill ſmaller order, on which there are ſeſſile, dark green, ſhining, lancet-ſhaped, notched leafits. The umbels are terminal and compound. The flowers conſiſt of five white heart-ſhaped leaves. The ſeeds are flat on the one ſide, and hemiſpherical on the other, with five ſerrated ribs. This laſt circumſtance, with the ſpots on the ſtalks, and the peculiar very nauſeous ſmell of the plant, ſomewhat reſembling the urine of a cat, ſerve to diſtinguiſh it from all other plants. We muſt not be miſled by its officinal name Cicuta, to confound it with the Cicuta viroſa of Linnæus, which is one of the moſt virulent plants produced in this country, and readily diſtinguiſhable from the conium, by having its roots always immerſed in water, which thoſe of the conium never are. The poſſibility of this miſtake ſhews the propriety of denominating all vegetables by their ſyſtematic names, as the Edinburgh college now do. The other plants which have been miſtaken for the conium maculatum are, the æthuſa cynapium, caucalis anthriſcus, and ſeveral ſpecies of chærophyllum, eſpecially the bulboſum, which, however, is not a native of this country.

Hemlock ſhould not be gathered unleſs its peculiar ſmell be ſtrong. The leaves ſhould be collected in the month of June, when the plant is in flower. The leafits are to be picked off, and the foot-ſtalks thrown away. The leafits are then to be dried quickly in a hot ſun, or rather on tin-plates before a fire, and preſerved in bags of ſtrong brown paper, or powdered and kept in cloſe veſſels, excluded from the light; for the light ſoon diſſipates their green colour, and with it the virtues of the medicine.

Med. uſe.—Freſh hemlock contains not only the narcotic, but alſo the acrid principle; of the latter much, and of the former little, is loſt by drying. The whole plant is a virulent poiſon, but varying very much in ſtrength according to circumſtances. When taken in an over-doſe, it produces vertigo, dimneſs of ſight, difficulty of ſpeech, nauſea, putrid eructations, anxiety, tremors, and paralyſis of the limbs. But Dr. Störk found, that in ſmall doſes it may be taken with great ſafety; and that, without at all diſordering the conſtitution, or even producing any ſenſible operation, it ſometimes proves a powerful reſolvent in many obſtinate diſorders. In ſcirrhus, the internal and external uſe of hemlock has been found uſeful, but then mercury has been generally uſed at the ſame time. In open cancer, it often abates the pains, and is free from the conſtipating effects of opium. It is likewiſe uſed in ſcrofulous tumours and ulcers, and in other ulcers that are only defined by the term ill-conditioned. It is alſo recommended by ſome in chincough, and various other diſeaſes. Its moſt common, and beſt form, is that of the powdered leaves, in the doſe at firſt of two or three grains a-day, which in ſome caſes has been gradually increaſed to upwards of two ounces a-day, without producing giddineſs. An extract from the ſeeds is ſaid to produce giddineſs ſooner than that from the leaves.

Off. prep.—Succ. ſpiſſat. con. maculat, *Ed. Lond. Dub.*

CONVOLVULUS.

Willd. g. 323.—*Pentandria Monogynia.*—Nat. ord. *Campanaceæ.*

Sp. 4. Convolvulus Scammonia. *Gummi-reſina.* (*Ed.*) *Scammonium. Gummi-reſina.* (*Lond. Dub.*)

Scammony. The gum-reſin.

The ſcammony convolvulus is a climbing perrenial plant, which grows in Syria, Myſia, and Cappadocia. The roots, which are very long and thick, when freſh contain a milky juice. To obtain this, the earth is removed from the upper part of the roots, and the tops of theſe are cut obliquely off. The milky juice which flows out, is collected in a ſmall veſſel, ſunk in the earth at the lower end of the cut. Each root furniſhes only a few drachms, but it is collected from ſeveral veſſels, and dried in the ſun. This is the true and unadulerated ſcammony. It is light, of a dark grey colour, but becomes of a whitiſh yellow when touched with the wet finger, is ſhining in its fracture, has a peculiar nauſeous ſmell, and bitter acrid taſte, and forms with water a greeniſh milky fluid, without any remarkable ſediment. In this ſtate of purity it ſeldom reaches us, but is commonly mixed with the expreſſed juice of the root, and even of the ſtalks and leaves, and often with flour, ſand, or earth. The beſt to be met with in the ſhops comes from Aleppo, in light ſpongy maſſes, having a heavy diſagreeable ſmell, friable, and eaſily powdered, of a ſhining aſh colour verging to black; when powdered, of a light grey or whitiſh colour. An inferior ſort is brought from Smyrna in more compact ponderous pieces, with leſs ſmell, not ſo friable, and leſs eaſily powdered, of a darker colour, not ſo reſinous, and full of ſand and other impurities.

Reſin is the principal conſtituent of ſcammony. Sixteen ounces of good Aleppo ſcammony, give eleven ounces of reſin, and three and a half of watery extract.

Med. uſe.—Scammony is an efficacious and ſtrong purgative. Some have condemned it as unſafe, and laid various ill qualities to its charge; the principal of which is, that its operation is uncertain, a full doſe proving ſometimes ineffectual, whilſt at others a much ſmaller one occaſions dangerous hypercatharſis. This difference, however, is owing entirely to the different circumſtances of the patient, and not to any ill quality, or irregularity of operation, of the medicine: where the inteſtines are lined with an exceſſive load of mucus, the ſcammony paſſes through, without exerting itſelf upon them;

where the natural mucus is deficient, a ſmall doſe of this or any other reſinous cathartic, irritates and inflames. Many have endeavoured to diminiſh the activity of this drug, and to correct its imaginary virulence, by expoſing it to the fumes of ſulphur, diſſolving it in acids, and the like: but theſe only deſtroy a part of the medicine, without making any alteration in the reſt. Scammony in ſubſtance, judiciouſly managed, ſtands not in need of any corrector: if triturated with ſugar, or with almonds, it becomes ſufficiently ſafe and mild in its operation. It may likewiſe be conveniently diſſolved, by trituration, in a ſtrong decoction of liquorice, and then poured off from the feces. The common doſe of ſcammony is from three to twelve grains.

Off. prep.—Elect. ſcammon. *Lond. Dub.* Pulv. comp. *Lond. Ed. Dub.* Pulv. ſcam. cum aloe, *Lond.* Pulv. ſcam. cum calom. *Lond.* Extract coloc. comp. *Lond.* Pulv. ſen. comp. *Lond.* Pil. aloes cum coloc. *Ed.*

Sp. 61. CONVOLVULUS JALAPA. *Radix.* (*Ed.*) *Jalapium. Radix.* (*Lond.*) *Jalapa. Radix.* (*Dub.*)

Jalap. The root.

JALAP is another climbing perennial ſpecies of convolvulus. It is an inhabitant of Mexico and Vera Cruz. It is brought to us in thin tranſverſe ſlices, which are covered with a blackiſh wrinkled bark, and are of a dark grey colour internally, marked with darker or blackiſh ſtripes. It has a nauſeous ſmell and taſte; and when ſwallowed it affects the throat with a ſenſe of heat, and occaſions a plentiful diſcharge of ſaliva. When powdered it has a yellowiſh grey colour.

Such pieces ſhould be choſen as are moſt compact, hard, weighty, dark-coloured, and abound moſt with black circular ſtriæ and ſhining points: the light, whitiſh, friable, worm-eaten pieces muſt be rejected.

Slices of bryony root are ſaid to be ſometimes mixed with thoſe of jalap: but they may be eaſily diſtinguiſhed, by their whiter colour, and leſs compact texture.

Neumann got from 7680 parts, 2480 alcoholic, and then by water 1200, and inverſely 2160 watery, beſides 360, which precipitated during the evaporation, and 1440 alcoholic: the tincture extracted from 7680 parts, when precipitated by water, gave 1920.

Medical uſe.—Jalap in ſubſtance, taken in a doſe of about half a drachm (leſs or more, according to the circumſtances of the patient) in plethoric, or cold phlegmatic habits, proves an effectual, and in general a ſafe purgative, performing its office mildly, ſeldom occaſioning nauſea or gripes, which too frequently accompany the other ſtrong cathartics. In hyphochondriacal diſorders, and hot bilious temperaments, it gripes violently, if the jalap be good; but rarely takes due effect as a purge. An extract originally made by water purges almoſt univerſally, but weakly; and at the ſame time has a conſiderable effect by urine: what remains after this proceſs gripes violently. The pure reſin, prepared by ſpirit of wine, occaſions moſt violent gripings, and other diſtreſſing ſymptoms, but ſcarcely proves at all cathartic: triturated with ſugar, or with almonds, into the form of an emulſion, or diſſolved in ſpirit, and mixed with ſyrups, it purges plentifully in a ſmall doſe, without occaſioning much diſorder: the part of the jalap remaining after the ſeparation of the reſin, yields to water an extract, which has no effect as a cathartic, but operates powerfully by urine.

Off. prep.—Tinct. *Ed. Lond. Dub.* Extract, *Ed. Lond. Dub.* Pulv. comp. *Ed.* Tinct. ſennæ comp. *Ed.*

COPAIFERA OFFICINALIS. *Reſina.* (*Ed.*) *Balſamum Copaiva.* (*Lond.*) *Balſamum Copaiba.* (*Dub.*)

Copaiva tree. The reſin. Balſam of Copaiva.

Willd. g. 880. *ſp.* 1. *Decandria Monogynia.*—Nat. ord. *Dumoſæ.*

THE tree which produces this reſin is a native of the Spaniſh Weſt-India iſlands, and of ſome parts of the continent of South America. It grows to a large ſize, and the reſinous juice flows in conſiderable quantities from inciſions made in the trunk.

The juice is clear and tranſparent, of a whitiſh or pale yellowiſh colour, an agreeable ſmell, and a bitteriſh pungent taſte. It is uſually about the conſiſtence of oil or a little thicker; when long kept, it becomes nearly as thick as honey, retaining its clearneſs; but has not been obſerved to grow dry or ſolid, as moſt of the other reſinous juices do. The beſt reſin of copaiva comes from Brazil; but we ſometimes meet with a thick ſort which is not at all tranſparent, or much leſs ſo than the foregoing, and generally has a portion of turbid watery liquor at the bottom. This is probably either adulterated by the mixture of other ſubſtances, or has been extracted by decoction from the bark and branches of the tree: its ſmell and taſte are much leſs pleaſant than thoſe of the genuine reſin.

Pure reſin of copaiva diſſolves entirely in alcohol: the ſolution has a very fragrant ſmell. Diſtilled with water it yields a large quantity of a limpid eſſential oil, but no benzoic acid: it is therefore not a balſam, but a combination of reſin and eſſential oil. Neumann ſays that it efferveſces with liquid ammonia.

Med. uſe.—The reſin of copaiva is an uſeful corroborating detergent medicine, but in ſome degree irritating. It ſtrengthens the nervous ſyſtem, tends to looſen the belly; in large doſes proves purgative, promotes urine, and cleans and heals exulcerations in the urinary paſſages, which it is ſuppoſed to perform more effectually than any of the other reſinous fluids. Fuller obſerves, that it gives the urine an intenſely bitter taſte, but not a violet ſmell as the turpentines do.

This reſin has been principally celebrated in gleets and the fluor albus, and externally as a vulnerary.

The doſe of this medicine rarely exceeds twenty or thirty drops, though ſome authors direct ſixty or upwards. It may be conveniently taken in the form of an oleoſaccharum, or in that of an emulſion, into which it may be reduced, by triturating it with almonds, with a thick mucilage of gum-arabic, or with the yolk of eggs, till they are well incorporated, and then gradually adding a proper quantity of water.

CORIANDRUM SATIVUM. *Semen.* (*Ed.*) *Coriandrum. Semen.* (*Lond. Dub.*)

Coriander. The ſeeds.

Willd. g. 552. *ſp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

CORIANDER is an annual, umbelliferous plant, a native of the ſouth of Europe, differing from all the others of that claſs in producing *ſpherical* ſeeds. Theſe, when freſh, have a ſtrong diſagreeable ſmell, which improves by drying, and becomes ſufficiently grateful: they are recommended as carminative and ſtomachic.

Off. prep.—Infuſ. ſennæ tart. *Lond.* Inf. tamarindi cum ſenna, *Ed.* Tinct. ſen. comp. *Ed.* Elect. ſennæ, *Ed. Lond.*

CROCUS SATIVUS. *Floris ſtigmata.* (*Ed.*) *Crocus. Floris ſtigma.* (*Lond.*) *Filamenta.* (*Dub.*)

Common ſaffron. The ſummits of the piſtils.

Willd. g. 92. *ſp.* 1. *Triandria Monogynia.*—Nat. ord. *Liliaceæ.*

CROCUS is a bulbous-rooted perennial plant, probably a native of the Eaſt, although it is now found wild in England, and other temperate countries of Europe. It is very generally cultivated as an ornament to our gardens, and in ſome places for the ſaffron, which is formed of the dried ſummits of the piſtil, and not of the filaments, as ſtated by the Dublin college. Each flower has one piſtil, the ſummit of which is deeply divided into three ſlips, which are of a dark orange-red colour, verging to white at the baſe, and are ſmooth and ſhining. Their ſmell is pleaſant and aromatic, but narcotic; their taſte a fine aromatic bitter, and they immediately give a deep yellow colour to the ſaliva when chewed. The flowers are gathered early in the morning, juſt before they open; the ſummits of the piſtils are picked out, very carefully dried by the heat of a ſtove, and compreſſed into firm cakes. In this iſland the Engliſh ſaffron is ſuperior to what is imported from other countries, and may be diſtinguiſhed by its blades being broader.

On the continent they reckon the Auſtrian and the French from Gatinois the beſt. The Spaniſh is rendered uſeleſs, by being dipt in oil, with the intention of preſerving it. Saffron ſhould be choſen freſh, not above a year old, in cloſe cakes, neither dry, nor yet very moiſt; tough and firm in tearing; difficultly pulverizable; of a fiery, orange-red colour; of the ſame colour within as without; of a ſtrong, acrid, diffuſive ſmell; and capable of colouring a very large proportion of water or alcohol. Saffron which does not colour the fingers when rubbed between them, or ſtains them with oil, has little ſmell or taſte, or a muſty or foreign flavour, is too tender, and has a whitiſh, yellow, or blackiſh colour, is bad. It is ſaid that it is ſometimes adulterated with the fibres of ſmoked beef, and with the flowers of the carthamus tinctorius, calendula officinalis, &c. The impoſition may be detected by the abſence of the white ends, which may be obſerved in the real ſaffron, by the inferior colouring power, and by the want of ſmell, or bad ſmell when thrown on live coals.

By diſtillation with water, ſaffron furniſhes a ſmall proportion of eſſential oil, of a golden yellow colour, heavier than water, and poſſeſſing the characteriſtic ſmell in an eminent degree. According to Hermbſtaedt, the ſoluble matter of ſaffron is extractive nearly pure. Neumann obtained from 480 dried ſaffron 360 grains of watery extract which was ſoluble in alcohol, except 24 of a colourleſs matter like ſand, and afterwards 20 of alcoholic; and inverſely, 320 of alcoholic extract entirely ſoluble in water, and then 90 of watery.

On account of the great volatility of the aromatic part of the ſaffron, it ſhould be wrapt up in bladder, and preſerved in a box or tin caſe.

Saffron is a very elegant aromatic: beſides the virtues which it has in common with all the bodies of that claſs, it has been alleged that it remarkably exhilarates, raiſes the ſpirits, and is deſervedly accounted one of the higheſt cordials: taken in large doſes, it is ſaid to occaſion immoderate mirth, involuntary laughter, and the ill effects which follow from the abuſe of ſpiritous liquors. The medicine is alſo ſaid to be particularly ſerviceable in hyſteric depreſſions, or obſtruction of the uterine ſecretions, where other aromatics, even thoſe of the more generous kind, have little effect. But ſome experiments made by Dr. Alexander ſerve to ſhew that it is much leſs powerful than was once imagined: and it was given in the Edinburgh infirmary by Dr. Henry Cullen, even to the extent of half an ounce a day, in ſeveral hyſterical caſes, without any ſenſible effect whatever; ſo that of late the eſtimation in which it was held as a medicine has been on the decline.

Off. prep.—Syr. croci, *Lond.* Tinct. croci, *Ed.* Tinctura aloes cum myrrha. *Ed. Lond.* Tinct. cinchon. comp. *Lond. Dub.* T.

rhub. *Lond.* T. rhub. comp. *Lond.* T. aloes ætherea, *Ed.* Vin. rhub. *Lond.* Pil. aloes cum myrrha, *Lond. Ed.* Elect. aromat. *Dub.* Confect. aromat. *Lond.*

CROTON ELEUTHERIA. *Swartz. Prod. Cortex.* (*Ed.*) *Caſcarilla. Cortex.* (*Lond. Dub.*)

Eleutheria or Caſcarilla. The bark.

Monoecea Adelphia.—Nat. ord. *Tricoccæ.*

THIS bark is imported into Europe from the Bahama iſlands, and particularly from one of them of the name of Eleutheria; from which circumſtance it was long known by the title of Eleutheria. But Dr. Wright alſo found the tree on the ſea-ſhore in Jamaica, where it is common, and riſes to about twenty feet. It is the Clutia eluteria of Linnæus: the bark of whoſe Croton caſcarilla has none of the ſenſible qualities of the caſcarilla of the ſhops.

The caſcarilla is in general brought to us either in curled pieces or rolled up into ſhort quills, about an inch in width, ſomewhat reſembling in appearance the Peruvian bark. It is covered with a rough whitiſh epidermis; and in the inſide it is of a browniſh caſt. When broken, it exhibits a ſmooth, cloſe, dark-brown ſurface.

This bark, when freed from the epidermis, which is inſipid and inodorous, has a light agreeable ſmell, and a moderately bitter taſte, accompanied with a conſiderable aromatic warmth. It is eaſily inflammable, and yields, when burning, a very fragrant ſmell, reſembling that of muſk; a property which diſtinguiſhes the caſcarilla from all other barks.

Its active conſtituents are aromatic eſſential oil and bitter extractive. Its virtues are partially extracted by water, and totally by rectified ſpirit; but it is moſt effectual when given in ſubſtance.

Med. uſe.—It produces a ſenſe of heat, and excites the action of the ſtomach; and it is therefore a good and pleaſant ſtomachic, and may be employed with advantage in flatulent colics, internal hæmorrhagies, dyſenteries, diarrhœas, and ſimilar diſorders.

As the eſſential oil is diſſipated in making the extract, this preparation acts as a ſimple bitter. It was much employed by the Stahlians in intermittent fever, from their fear of uſing Cinchona bark, to which, however, it is much inferior in efficacy.

Off. prep.—Tinct. *Lond. Dub.* Extract, *Lond.*

CUCUMIS COLOCYNTHIS. *Fructus, corticæ ſeminibuſque abjectis.* (*Ed.*) *Colocynthis Fructus medulla.* (*Lond. Dub.*)

Coloquintida, or bitter apple. The medullary part of the fruit.

Monoecia Syngeneſia.—Nat. ord. *Cucurbitaceæ.*

THIS is an annual plant of the gourd kind, a native of Turkey. The fruit is about the ſize of an orange; its medullary part, freed from the rind and ſeeds, is alone made uſe of in medicine; this is very light, white, ſpongy, compoſed of membranous leaves, of an extremely bitter, nauſeous, acrimonious taſte. It is gathered in autumn when it begins to turn yellow, and is then peeled and dried quickly, either in a ſtove or in the ſun. In the latter caſe it ſhould be covered with paper.

Neumann got from 7680 parts 1680 alcoholic extract, and then 2160 watery; and inverſely, 3600 watery and 224 alcoholic.

Med. uſe.—Colocynth is one of the moſt powerful and moſt violent cathartics. Many eminent phyſicians condemn it as dangerous, and even deleterious: others recommend it not only as an efficacious purgative, but likewiſe as an alterative in obſtinate chronical diſorders. This much is certain, that colocynth, in the doſe of a few grains, acts with great vehemence, diſorders the body, and ſometimes occaſions a diſcharge of blood. Many attempts have been made to correct its virulence by the addition of acids, aſtringents, and the like: theſe may leſſen the force of the colocynth, but no otherwiſe than might be equally done by a reduction of the doſe. The beſt method of abating its virulence, without diminiſhing its purgative virtue, ſeems to be by triturating it with gummy farinaceous ſubſtances, or the oily ſeeds.

Off. prep.—Extract col. comp. *Lond.* Pil. aloes cum colocynth *Ed.*

CUMINUM CYMINUM. *Cuminum. Semen.* (*Lond.*)
Cummin. The ſeeds.

Willd. g. 547. *ſp.* 1.—*Pentandria Monogynia.*—Nat. ord. *Umbellatæ.*

The cummin is an annual umbelliferous plant, in appearance reſembling fennel, but much ſmaller. It is a native of Egypt; but the ſeeds uſed in Britain are brought chiefly from Sicily and Malta. Cummin ſeeds have a bitteriſh warm taſte, accompanied with an aromatic flavour, not of the moſt agreeable kind, reſiding in a volatile oil.

Off. prep.—Cataplaſm cum. *Lond.* Emplaſt. cum. *Lond.*

CUPRUM. (*Lond. Dub. Ed.*)
Copper.

Copper is found in many countries,

a. In its metallic ſtate:

1. Cryſtallized.
2. Alloyed with arſenic and iron.
3. Sulphuretted.

b. Oxidized:

4. Uncombined.

5. Combined with carbonic acid.
6. ———— ſulphuric acid.
7. ———— arſenic acid.

The general properties of copper have been already enumerated.

Copper has a more perceptible ſmell and taſte than almoſt any other metal. Its effects when taken into the ſtomach are highly deleterious, and often fatal. It particularly affects the primæ viæ, exciting exceſſive nauſea, vomiting, colic pains, and purging, ſometimes of blood, or, though more rarely, obſtinate conſtipation. It alſo produces agitation of the mind, headach, vertigo, delirium; renders the pulſe ſmall and weak, the countenance pale, and cauſes fainting, convulſions, paralyſis, and apoplexy. When any of theſe ſymptoms occur, we muſt endeavour to obviate the action of the poiſon by large and copious draughts of oily and mucilaginous liquors, or to deſtroy its virulence by ſolutions of potaſs, or ſulphuret of potaſs.

Poiſoning from copper is moſt commonly the effect of ignorance, accident, or careleſſneſs; and too many examples are met with of fatal conſequences enſuing upon eating food which had been dreſſed in copper veſſels not well cleaned from the ruſt which they had contracted by lying in the air; or pickles, to which a beautiful green colour had been given, according to the murderous directions of the moſt popular cookery books, by boiling them with halfpence, or allowing them to ſtand in a braſs pan until a ſufficient quantity of verdegris was formed.

Great care ought to be taken that acid liquors, or even water, deſigned for internal uſe, be not ſuffered to ſtand long in veſſels made of copper, otherwiſe they will diſſolve ſo much of the metal as will give them dangerous properties. But the ſure preventative of theſe accidents is to baniſh copper utenſils from the kitchen and laboratory. The preſence of copper in any ſuſpected liquor is eaſily detected by inſerting into it a piece of poliſhed ſteel, which will ſoon be coated with copper, or by dropping into it ſome carbonate of ammonia, which will produce a beautiful blue colour if any copper be preſent.

But although copper be thus dangerous, ſome preparations of it are in certain caſes uſed with great advantage both externally and internally.

The chief of theſe are,

1. The ſub-acetite of copper.
2. The ſulphate of copper.
3. The ſub-ſulphate of copper and ammonia.
4. The muriate of copper and ammonia.

5. A ſolution of the ſulphate of copper, and ſuper-ſulphate of alumina in ſulphuric acid.

As the two firſt of theſe are never prepared by the apothecary, but bought by him from the manufacturer, they are inſerted in the liſt of materia medica.

Sub-Acetis Cupri. (*Ed.*) *Æurgo.* (*Lond. Dub.*)
Sub-acetite of Copper. Verdegris.

The preparation of this ſubſtance was almoſt confined to Montpelier in France, owing chiefly to an excellent regulation which exiſted, that no verdegris could be ſold until it had been examined and found of ſufficiently good quality. For ſince that regulation has been aboliſhed, Chaptal informs us, that ſo many abuſes have crept into the manufacture, that the Montpelier verdegris has loſt its decided ſuperiority of character. It is prepared by ſtratifying copper plates with the huſks and ſtalks of the grape, which have been made to ferment after the wine has been expreſſed from them. In from ten to twenty days, when the huſks become white, the plates of copper are taken out, and their ſurfaces are found to be covered with detached and ſilky cryſtals. They are now placed on edge, with their ſurfaces in contact, in the corner of a cellar, and alternately dipt in water, and replaced to dry every ſeven or eight days, for ſix or eight times. By this management, the plates ſwell, and are every where covered with a coat of verdegris, which is eaſily ſeparated with a knife. In this ſtate it is only a paſte, and is ſold by the manufacturers to commiſſioners, who beat it well with wooden mallets, and pack it up in bags of white leather, a foot high and ten inches wide, in which it is dried by expoſing it to the air and ſun, until the loaf of verdegris cannot be pierced with the point of a knife.

Sub-acetite of copper ſhould be of a bluiſh-green colour, dry and difficult to break, and ſhould neither deliqueſce, have a ſalt taſte, contain any black or white ſpots, nor be adulterated with earth or gypſum. Its purity may be tried by diluted ſulphuric acid, in which the ſub-acetite diſſolves entirely, and the impurities remain behind.

Verdegris, as it comes to us, is generally mingled with ſtalks of the grape; they may be ſeparated, in pulverization, by diſcontinuing the operation as ſoon as what remains ſeems to be almoſt entirely compoſed of them.

Med. uſe.—Verdegris is never or rarely uſed internally. Some writers highly extol it as an emetic, and ſay, that a grain or two act as ſoon as received into the ſtomach; but its uſe has been too often followed by dangerous conſequences to allow of its employment.

Verdegris applied externally, proves a gentle detergent and eſcharotic, and is employed to deſtroy callous edges, or fungous fleſh in wounds. It is alſo advantageouſly applied to ſcorbutic ulcers of the mouth, tongue, or fauces, and deſerves to be carefully tried in cancerous ſores. With theſe intentions it is an ingredient in different officinal compoſitions.

Off. prep.—Oxymel aeruginis, *Lond.* Acid acetos. *Lond.* Aerug. ppt. *Lond.* Ungt. ſub-acet. cupri, *Ed.* Empl. mel. veſ. comp. *Ed.*

Sulphas Cupri. (*Ed.*) *Cuprum vitriolatum.* (*Dub.*) *Vitriolum cœruleum.* (*Lond.*)

Sulphate of copper. Blue vitriol.

This metallic ſalt is rarely formed by combining directly its component parts; but it is obtained, either by evaporating mineral waters which contain it, or by acidifying native ſulphuretted copper, by expoſing it to the action of air and moiſture, or by burning its ſulphur.

When pure it has a deep blue colour, and is cryſtallized generally in long rhomboids. It effloreſces ſlightly in the air, is ſoluble in four parts of water at 60°, and in two at 212°, and is inſoluble in alcohol. By heat it loſes, firſt its water of cryſtallization, and afterwards all its acid. It is decompoſed by the alkalies and earths, and ſome of the metals, the alkaline carbonates, borates, and phoſphates, and ſome metallic ſalts.

It is compoſed of,

$$\left.\begin{array}{lr}\text{Copper,} & 24\\ \text{Oxygen,} & 8\\ \text{Water,} & 10\end{array}\right\}\ 42\ \text{hydro-oxide of copper.}$$

33 ſulphuric acid.
25 water of cryſtallization.

100

The ſulphate of copper has a ſtrong, ſtyptic, metallic taſte, and is chiefly uſed externally as an eſcharotic for deſtroying warts, callous edges, and fungous excreſcences, as a ſtimulant application to ill-conditioned ulcers, and as a ſtyptic to bleeding ſurfaces. Taken internally, it operates, in very ſmall doſes, as a very powerful emetic. It has, however, been exhibited in incipient phthiſis pulmonalis, intermittent fever, and epilepſy; but its uſe is not free from danger.

Off. prep.—Solutio ſulphatis cupri compoſita, *Ed.* Ammoniaretum cupri, *Ed. Lond. Dub.*

CURCUMA LONGA. *Curcuma. Radix.* (*Lond.*)

Turmeric. The root.

Wild. g. 11. *ſp.* 2. *Monandria Monogynia.*—Nat. ord. *Scitamineæ.*

Turmeric is a perennial plant, a native of the Eaſt Indies. The roots are tuberous, knotty, and long, wrinkled, externally of a pale yellow colour, and internally of a ſhining ſaffron brown. They have a weak aromatic ſmell, and a ſlightly bitter aromatic taſte. They contain a very little eſſential oil; and Neumann got from 960 parts, 320 watery, and afterwards 50 alcoholic extract, and inverſely 150 alcoholic, and 210 watery.

Medical uſe.—Turmeric, when taken internally, tinges the urine of a deep yellow colour, and acts as a gentle ſtimulant. It has been celebrated in diſeaſes of the liver, jaundice, cachexy, dropſy, intermittent fevers, &c. But its internal uſe in this country is almoſt confined to its being a principal ingredient in the compoſition of curry powder, in which form it is uſed in immenſe quantities in the Eaſt Indies. It is alſo a valuable dye-ſtuff, and an excellent chemical teſt of the preſence of uncombined alkalies; for the yellow colour of turmeric is changed by them to a reddiſh brown.

CINARA SCOLYMUS. *Folia.* (*Ed.*) *Cinara. Folium.* (*Lond.*) *Cinara Hortenſis. Folia.* (*Dub.*)

Artichoke. The leaves.

Syngeneſia Polygamia æqualis.—Nat. ord. *Compoſitæ capitatæ.*

The artichoke is a perennial plant, indigenous in the ſouth of Europe, but very frequently cultivated in our gardens for culinary purpoſes.

The leaves are bitter, and afford by expreſſion a conſiderable quantity of juice, which is ſaid to be diuretic, and to have been ſucceſsfully uſed in dropſy.

DAPHNE MEZEREUM. *Radicis Cortex.* (*Ed.*) *Mezereum. Radicis Cortex.* (*Lond.*) *Mezereon. Radix, Cortex.* (*Dub.*)

Mezereon, or ſpurge laurel. The bark of the root.

Willd. g. 773. *ſp.* 1. *Octandria Monogynia.*—Nat. ord. *Veprecula.*

Mezereon is a ſhrub which grows in woody ſituations in the northern parts of Europe, and is admitted into our gardens from its flowering in winter. The bark, which is taken from the trunk, larger branches, and root, is thin, ſtriped reddiſh, commonly covered with a brown cuticle, has no ſmell, and when chewed, excites an inſupportable ſenſation of burning in the mouth and throat. When applied to the ſkin in its recent ſtate, or infuſed in vinegar, it raiſes bliſters.

Medical uſe.—The root was long uſed in the Liſbon diet-drink, for venereal complaints, particularly nodes and other ſymptoms reſiſting the uſe of mercury. The bark of the root contains moſt acrimony, though ſome prefer the woody part. Mezereon has alſo been uſed with good effects in tumours and cutaneous eruptions not venereal.

Dr. Cullen ſays that it acts upon the urine, ſometimes giving it a filamentous appearance, and upon the perſpiration, without diminiſhing the ſtrength remarkably; and that in irritable habits it quickens the pulſe, and increaſes the heat of the whole body. But Mr. Pearſon of the Lock-Hoſpital ſays, that excepting a caſe or two of lepra, in which a decoction of this plant conferred temporary benefit, he very ſeldom found it poſſeſſed of medicinal virtues, either in ſyphilis, or in the ſequelæ of that diſeaſe. In ſcrofula, or in cutaneous affections, it is employed chiefly under the form of decoction; and it enters the decoctum ſarſaparillæ compoſitum of the London college; but it has alſo been uſed in powder, combined with ſome inactive one, as that of liquorice root. It is apt to occaſion vomiting and purging; ſo muſt be begun in grain-doſes, and gradually increaſed. It is often combined with mercury.

The berries are ſtill more acrid than the bark, and they have even been known to produce fatal effects on children, who have been tempted by their beauty to eat them. It is ſaid that they are ſometimes infuſed in vinegar, to make it more pungent, and appear ſtronger.

Off. prep.—Decoct, *Ed.* Decoct. ſarſ. comp. *Lond. Dub.*

DATURA STRAMONIUM. *Herba.* (*Ed.*) *Stramonium officinale.*

Thorn-apple. The plant.

Willd. g. 377. *ſp.* 2. *Pentandria Monogynia.*—Nat. ord. *Solanaceæ.*

The thorn-apple is an annual plant, a native of America, but now growing wild on dry hills and uncultivated places in England and other parts of Europe. The leaves are dark green, ſeſſile, large, egg-ſhaped, pointed, angular, and deeply indented, of a diſagreeable ſmell and nauſeous taſte. Every part of the plant is a ſtrong narcotic poiſon, producing vertigo, torpor, death. The beſt antidote to its effects is ſaid to be vinegar.

Med. uſe.—Dr. Störk firſt tried it as a remedy in mania and melancholy with conſiderable ſucceſs. Several caſes of the ſame diſeaſes were alſo cured or relieved by it, under the direction of different Swediſh phyſicians; and although in other experiments it frequently failed, we think that it deſerves the attention of practitioners, and well merits a trial, in affections often incurable by other means.

Beſides maniacal caſes, the ſtramonium has been alſo employed, and ſometimes with advantage, in convulſive and epileptic affections. It is not only taken internally, but has alſo been uſed externally. An ointment prepared from the leaves of the ſtramonium has been ſaid to give eaſe in external inflammations and hæmorrhoids.

The inſpiſſated juice of the leaves has been commonly uſed, but its exhibition requires the greateſt caution. At firſt, one fourth of a grain is a ſufficient doſe.

The powder of the leaves or ſeeds promiſes to furniſh a more certain or convenient formula than the inſpiſſated juice.

DAUCUS CAROTA. *Semen.* (*Ed.*) *Daucus ſylveſtris. Semen.* (*Lond. Dub.*)

Wild Carrot. The ſeed.

Willd. g. 530. *ſp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

THIS is a biennial plant, which grows wild in Britain, and is cultivated in great quantities as an article of food. The ſeeds, eſpecially of the wild variety, have a moderately warm pungent taſte, and an agreeable aromatic ſmell. They are carminative, and are ſaid to be diuretic. The roots, eſpecially of the cultivated variety, contain much mucilaginous and ſaccharine matter, and are therefore highly nutritious and emollient. When beaten to a pulp, they form an excellent application to carcinomatous and ill-conditioned ulcers, allaying the pain, checking the ſuppuration and fetid ſmell, and ſoftening the callous edges.

DELPHINIUM STAPHISAGRIA. *Staphiſagria. Semen.* (*Lond. Dub.*)

Staveſacre. The ſeed.

Willd. g. 1061. *ſp.* 13. *Polyandria Trigynia.*—Nat. ord. *Multiſiliquæ.*

STAVESACRE is a biennial plant, a native of the ſouth of Europe. The ſeeds are uſually brought from Italy. They are large and rough, of an irregular triangular figure, of a blackiſh colour on the outſide, and yellowiſh or whitiſh within; they have a diſagreeable ſmell, and a very nauſeous, bitteriſh, burning taſte.

Neumann got from 480 parts, 45 alcoholic extract, beſides 90 of fixed oil, which ſeparated during the proceſs, and afterwards 44 inſipid watery, and inverſely 95 watery, and then by alcohol only one, beſides 71 of oil.

Medical uſe.—Staveſacre was employed by the ancients as a cathartic; but it operates with ſo much violence, both upwards and downwards, that its internal uſe has been, among the generality of practitioners, for ſome time laid aſide. It is chiefly employed in external applications for ſome kinds of cutaneous eruptions, and for deſtroying lice and others inſects; inſomuch, that from this virtue it has received its name, in different languages.

DIANTHUS CARYOPHYLLUS. *Flores.* (*Ed.*) *Caryophyllum rubrum.* *Flos.* (*Lond. Dub.*)

Clove Gilly-flower. The flowers.

Willd. g. 893. *ſp.* 9. *Decandria Digynia.*—Nat. ord. *Caryophylleæ.*

THIS ſpecies of dianthus is a native of Italy, and is perennial. By cultivation, its varieties have increaſed to a very great number, and they form one of the greateſt ornaments of our gardens. Moſt of theſe are termed Carnations, but the variety which is officinal ſurpaſſes all the others in the richneſs of its ſmell, and is alſo diſtinguiſhed by its colour, being of an uniform deep crimſon. Their only uſe in pharmacy is to give a pleaſant flavour and beautiful colour to an officinal ſyrup.

Off. prep.—Syr. dianthi caryophyll. *Ed. Lond.*

DIGITALIS PURPUREA. *Folia.* (*Ed.*) *Digitalis. Folium.* (*Lond. Dub.*)

Foxglove. The leaves.

Willd. g. 1155. *ſp.* 1. *Didynamia Angioſpermia.*—Nat. ord. *Solanaceæ.*

THIS is an indigenous biennial plant, very common on hedge-banks, and ſides of hills, in dry, gravelly, or ſandy ſoils, and the beauty of its appearance has gained it a place in our gardens and ſhrubberies. The leaves are large, oblong, egg-ſhaped, ſoft, covered with hairs, and ſerrated. They have a bitter, very nauſeous taſte, with ſome acrimony.

Med. uſe.—Its effects when ſwallowed are,

1. To diminiſh the frequency of the pulſe.
2. To diminiſh the irritability of the ſyſtem.
3. To increaſe the action of the abſorbents.
4. To increaſe the diſcharge by urine.

In exceſſive doſes, it produces vomiting, purging, dimneſs of ſight, vertigo, delirium, hiccough, convulſions, collapſe, death. For theſe ſymptoms the beſt remedies are cordials and ſtimulants.

Internally, digitalis has been recommended,

1. In inflammatory diſeaſes, from its very remarkable power of diminiſhing the velocity of the circulation.

2. In active hæmorrhagies, in phthiſis.

3. In ſome ſpaſmodic affections, as in ſpaſmodic aſthma, palpitation, &c.

4. In mania from effuſion on the brain.

5. In anaſarcous and dropſical effuſions.

6. In ſcrofulous tumours.

7. In aneuriſm of the aorta, we have ſeen it alleviate the moſt diſtreſſing ſymptoms.

Externally, it has been applied to ſcrofulous tumours.

It may be exhibited,

1. In ſubſtance, either by itſelf, or conjoined with ſome aromatic, or made into pills with ſoap or gum ammoniac. Withering directs the leaves to be gathered after the flowering ſtem has ſhot up, and about the time when the bloſſoms are coming forth. He rejects the leaf-ſtalk, and middle rib of the leaves, and dries the remaining part either in the ſunſhine or before the fire. In this ſtate they are eaſily reduced to a beautiful green powder, of which we may give at firſt one grain twice a-day, and gradually increaſe the doſe until it act upon the kidneys, ſtomach, pulſe, and bowels, when its uſe muſt be laid aſide or ſuſpended.

2. In infuſion. The ſame author directs a drachm of the dried leaves to be infuſed for four hours in eight ounces of boiling water, and that there be added to the ſtrained liquor an ounce of any ſpiritous water, for its preſervation. Half an ounce or an ounce of this infuſion may be given twice a-day.

3. In decoction. Darwin directs that four ounces of the freſh leaves be boiled from two pounds of water to one, and half an ounce of the ſtrained decoction be taken every two hours, for four or more doſes.

4. In tincture. Put one ounce of the dried leaves coarſely powdered into four ounces of diluted alcohol; let the mixture ſtand by the fire-ſide twenty four hours, frequently ſhaking the bottle; and the ſaturated tincture, as Darwin calls it, muſt then be ſeparated from the reſiduum by ſtraining or decantation. Twenty drops of this tincture may be taken twice or thrice a-day. The Edinburgh college uſe eight ounces of diluted alcohol to one of the powder, but let it digeſt ſeven days.

5. The expreſſed juice and extract are not proper forms of exhibiting this very active remedy.

When the digitalis is diſpoſed to excite looſeneſs, opium may be advantageouſly conjoined with it; and when the bowels are tardy, jalap may be given at the ſame time, without interfering with its diuretic effects. During its operation in this way, the patient ſhould drink very freely.

Off. prep.—Inf. digit. *Ed.* Tinct. digit. *Ed.*

DOLICHOS PRURIENS. *Pubes leguminis rigida.* (*Ed.*) *Dolichos. Setæ leguminum.* (*Dub.*)

Cow-itch. The ſtiff hairs which cover the pods.

Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*

The dolichos is a climbing plant growing in great abundance in warm climates, particularly in the Weſt Indies. The pods are about four inches long, round, and as thick as a man's finger. The outſide of the pods is thickly beſet with ſtiff brown hairs, which, when applied to the ſkin, occaſion a moſt intolerable itching. The ripe pods are dipped in ſyrup, which is again ſcraped off with the knife. When the ſyrup is rendered by the hairs as thick as honey, it is fit for uſe. It acts mechanically as an anthelmintic, occaſions no uneaſineſs in the primæ viæ, which are defended by mucus, and may be ſafely taken, from a tea-ſpoonful to a table-ſpoonful in the morning, faſting. The worms are ſaid to appear with the ſecond or third doſe; and by means of a purge in ſome caſes, the ſtools have conſiſted entirely of worms.

DORSTENIA CONTRAJERVA. *Radix.* (*Ed.*) *Contrayerva.* *Radix.* (*Dub. Lond.*)

Contrayerva. The root.

Willd. g. 244. *ſp.* 5. *Tetrandria Monogynia.*—Nat. ord. *Scabridæ.*

THIS plant is perennial, and grows in South America, and ſome of the Caribæan iſlands.

The root is knotty, an inch or two long, and about half an inch thick, of a reddiſh brown colour externally, and pale within: long, rough, ſlender fibres ſhoot out from all ſides of it; and are generally loaded with ſmall round knots. It has a peculiar kind of aromatic ſmell, and a ſomewhat aſtringent, warm, bitteriſh taſte, with a light and ſweetiſh kind of acrimony, when long chewed: the fibres have little taſte or ſmell; the tuberous part, therefore, ſhould be alone choſen.

This root contains ſo much mucilage, that a decoction of it will not paſs through the filter. Neumann got from 480 parts, 190 watery extract, and afterwards with alcohol 7, and inverſely 102 alcoholic, and 60 watery. I find that the tincture reddens infuſion of lithmus, is precipitated by water, and has no effect on the ſalts of iron.

Medical uſe.—Contrayerva is a gentle ſtimulant and diaphoretic, and is ſometimes given in exanthematous diſeaſes, typhus, and dyſentery. Its doſe is about half a drachm.

Off. prep.—Pulv. contrayerv. comp. *Lond.*

ERYNGIUM MARITIMUM. *Eryngium. Radix.* (*Lond. Dub.*)

Eryngo. The root.

Willd. g. 518. *ſp.* 6. *Pentandria Monogynia.*—Nat. ord. *Umbellatæ.*

THIS plant grows plentifully on ſome of our ſandy and gravelly ſhores: the roots are ſlender, and very long; of a pleaſant ſweetiſh taſte, which, on chewing them for ſome time, is followed by a light degree of aromatic warmth and acrimony. They are accounted aperient and diuretic, and have alſo been celebrated as aphrodiſiac; their virtues, however, are too weak to admit them under the head of medicines.

EUGENIA CARYOPHYLLATA. *Caryophyllus Aromaticus. Floris germen, et oleum ejus volatile.* (*Ed.*) *Caryophylla aromatica, et oleum eorundem eſſentiale.* (*Dub.*) *Caryophyllus aromatica. Pericarpium immaturum, et oleum ejus eſſentiale.* (*Lond.*)

The clove tree. The flower-bud and its eſſential oil.

Willd. g. 972. *ſp.* 24. *Icoſandria Monogynia.*—Nat. ord. *Heſperideæ.*

This is a beautiful tall tree, a native of the Molucca iſlands. The Dutch, from the deſire of monopolizing the valuable ſpice produced by it, deſtroyed all the trees except in Amboyna, where it is carefully cultivated. But their ſcheme has been fruſtrated, and the clove is now thriving in the Iſle of France and other places. Every part of this tree is highly aromatic, but eſpecially the leaf-ſtalk. Cloves are the flower-buds, which are gathered in October and November, before they open, and when they are ſtill green, and which are expoſed to ſmoke for ſome days, and then dried in the ſun.

Cloves have ſomewhat the form of a nail, conſiſting of a globular head, formed of the four petals of the corolla, and four leaves of the calyx not yet expanded; but this part is often wanting, being eaſily broken off; and a germen ſituated below, nearly round, but ſomewhat narrower towards the bottom; ſcarcely an inch in length, and covered with another thicker calyx, divided above into four parts. Their colour ſhould be of a deep brown, their ſmell ſtrong, peculiar, and grateful; their taſte acrid, aromatic, and permanent. The beſt cloves are alſo large, heavy, brittle, and when preſſed with the nail, exude a little oil. When light, ſoft, wrinkled, dirty, pale, and without ſmell or taſte, they are to be rejected.

The Dutch, from whom we have this ſpice, frequently mix it with cloves from which the oil has been diſtilled. Theſe, though in time they regain from the others a conſiderable ſhare both of taſte and ſmell, are eaſily diſtinguiſhable by their weaker flavour and lighter colour.

Cloves yield by diſtillation with water about one ſeventh of their weight of volatile oil; 960 parts alſo gave to Neumann 380 of a nauſeous, ſomewhat aſtringent, watery extract. The ſame quantity gave only 300 of exceſſively fiery alcoholic extract. When the alcoholic extract is freed from the volatile oil by diſtillation with water, the oil that ariſes proves mild, and the reſin that remains inſipid. Its pungency therefore ſeems to depend on the combination of theſe principles. The Dutch oil of cloves is extremely hot and fiery, and of a reddiſh brown colour, but it is greatly adulterated, both with fixed oils and reſin of cloves; for the genuine oil when recently diſtilled, is comparatively quite mild, and colourleſs, although it gradually acquires a yellow colour. It is heavier than water, and riſes in diſtillation with ſome difficulty, ſo that it is proper to uſe a very low headed ſtill, and to return the diſtilled water ſeveral times upon the reſiduum.

Medical uſe.—Cloves, conſidered as medicines, are very hot ſtimulating aromatics, and poſſeſs in an eminent degree the general virtues of ſubſtances of this claſs.

Off. prep.—Spt. lav. comp. *Ed. Lond. Dub.* Spt. ammon. comp. *Lond.* Confect. arom. *Lond.* Elect. ſcammon. *Lond. Dub.* Pil. aloes cum col. *Ed.*

FERRUM.

Iron is the moſt common of all metals. It ſeems even to be a conſtituent of organic ſubſtances, and is the only metal which, when taken into the body, exerts no deleterious action upon it. The numerous ores of it which are found in every part of the globe, may be reduced to the following genera.

1. Native iron. Immenſe iſolated maſſes of this have been found in Siberia and in South America. Their origin is ſtill perfectly problematical.
2. Carburetted iron. Plumbago.
3. Sulphuretted iron. Pyrites.
4. Oxidized iron.

   a. Protoxide. Magnetic iron ore; colour black or grey.
   b. Peroxide. Not magnetic; colour red or brown.
   c. Carbonated.
   d. Arſeniated.
   e. Tungſtated.

The properties of iron, when obtained from any of theſe ores by the uſual proceſſes of fuſion, &c. have been already deſcribed. As its mechanical diviſion is extremely difficult, it is directed to be kept in the ſhops in the ſtate of filings or wire, and the ſcales of black oxide, which are found around the ſmith's anvil. Soft malleable iron is the only kind fit for internal uſe, as ſteel and caſt-iron always contain impurities, and often arſenic.

Medical uſe.—The general virtues of this metal, and the ſeveral preparations of it, are, to conſtringe the fibres, to quicken the circulation, to promote the deficient ſecretions in the remoter parts, and at the ſame time to repreſs inordinate diſcharges into the inteſtinal tube. After the uſe of them, if they take effect, the pulſe is very ſenſibly raiſed; the colour of the face, though before pale, changes to a florid red; the alvine, urinary, and cuticular excretions, are increaſed. Fetid eructations, and the fæces voided of a black colour, are marks of their taking due effect.

When given improperly or to exceſs, iron produces headach, anxiety, heats the body, and often cauſes hæmorrhagies, or even vomiting, pains in the ſtomach, and ſpaſms and pains of the bowels.

Iron is given in moſt caſes of debility and relaxation,

1. In paſſive hæmorrhagies.
2. In dyſpepſia, hyſteria, and chloroſis.
3. In moſt of the cachexiæ.
4. In general debility produced by diſeaſe, or exceſſive hæmorrhage.

Where either a preternatural diſcharge, or ſuppreſſion of natural ſecretions, proceed from a languor and ſluggiſhneſs of the fluids, and weakneſs of the ſolids; this metal, by increaſing the motion of the former, and the ſtrength of the latter, will ſuppreſs the flux, or remove the ſuppreſſion; but where the circulation is already too quick, the ſolids too tenſe and rigid, where there is any ſtricture or ſpaſmodic contraction of the veſſels, iron, and all the preparations of it, will aggravate both diſtempers.

Iron is preſcribed

I. In its metallic ſtate. *Limatura ferri.*
II. Oxidized.
  a. Protoxide. *Squamæ ferri. Ferri oxidum nigrum.*
    1. Super-carbonated, as in the chalybeate mineral waters.
    2. Sulphated. *Sulphas ferri.*
    3. Combined with tartrate of potaſs. *Tartris ferri et potaſſæ.*
  b. Peroxide. *Ferri oxidum rubrum.*
    1. Carbonated. *Carbonas ferri.*
    2. Muriated. *Murias ferri ferrugineus.*
    3. Combined with muriate of ammonia. *Murias ammoniæ et ferri.*

Ferrum. (*Lond.*) *Ferri limaturæ.* (*Ed.*) *Ferrum in fila deductum.* (*Dub.*)

Iron. Iron-filings. Iron wire.

Iron probably has no action on the body when taken into the ſtomach, unleſs it be oxidized. But during its oxidizement, hydrogen gas is evolved; and accordingly we find that fetid eructations are conſidered as a proof of the medicine having taken effect.

It can only be exhibited internally in the ſtate of filings, which may be given in doſes of from five to twenty grains, either in the form of powder, with ſome aromatic, or made into an electuary or bolus or pills with any bitter extract. Iron-wire is to be preferred for pharmaceutical preparations, both becauſe it is the moſt convenient form, and becauſe it is always made of the pureſt iron.

Off. prep.—Ferri limatura purificata, *Ed.* Carbonas ferri, *Ed. Lond. Dub.* Aqua ferri ærati, *Dub.* Sulphas ferri, *Ed. Lond. Dub.* Tincturas ferri muriati, *Dub.* Ferrum ammoniacale, *Lond.* Ferrum tartariſatum, *Lond.* Vinum ferri, *Lond. Dub.* Hydrarg. purif. *Lond. Ed.*

FERRI OXIDUM NIGRUM. *Ferri ſquamæ.* (*Ed.*)
The ſcales of iron.

WHEN iron is heated to redneſs in the ſmith's forge, to render it more malleable, its ſurface becomes oxidized by the action of the atmoſpheric air; and as the oxide formed does not adhere to the iron, it is eaſily ſeparated by percuſſion on the anvil, and flies off in the ſtate of ſparks, which, on cooling, conſtitute the ſcales of iron. In theſe the iron is oxidized to that degree in which it is ſoluble in acids, without the production of hydrogen gas; therefore, when taken into the ſtomach, they do not produce the diſtention and flatulence occaſioned by the uſe of the filings.

Off. prep.—Ferri oxidum nigrum purificatum, *Ed.* Tinctura muriatis ferri, *Ed.*

SULPHAS FERRI. *Ferrum vitriolatum.* (*Dub.*)
Sulphate of iron. Green vitriol. Copperas.

THE ſulphate of iron of commerce is commonly obtained by the ſpontaneous oxidizement of ſulphuretted iron, and ſubſequent lixiviation and cryſtallization. It is never pure, and often contains zinc or copper. The copper may be ſeparated by adding ſome metallic iron to the ſolution, but we have no means of ſeparating the zinc; therefore we muſt prepare it by diſſolving iron in diluted ſulphuric acid, in order to obtain it in a ſtate of purity. Its cryſtals are tranſparent rhomboidal priſms, of a fine green colour. They are ſoluble in two parts of cold, and in leſs than their own weight of boiling water. They are inſoluble in alcohol.

They are compoſed of

Black oxide of iron, 28 }
Water of compoſition, 8 } 36 Green hydro-oxide of iron.
26 Sulphuric acid.
38 Water of cryſtallization.

100

Green ſulphate of iron is decompoſed by all the earths and alkalies, and by thoſe ſalts whoſe baſe forms an inſoluble compound with ſulphuric acid. It is alſo decompoſed by expoſure to the air, eſpecially when in ſolution, and by all ſubſtances which part readily with their oxygen. The oxide of iron abſorbs oxygen, and paſſes to the ſtate of red oxide, which forms a red ſulphate, poſſeſſing properties very different from thoſe of the green ſulphate.

Taken into the ſtomach, the green ſulphate is apt to excite pain in the ſtomach, and ſpaſms in the bowels; and in large doſes it cauſes vomiting. In ſmall doſes, however, of from one to three grains, it is ſometimes given as a tonic, aſtringent, or anthelmintic.

Off. prep.—Acidum acetoſum forte, *Ed.* Carbonas ferro praec. *Ed.* Tinctura ferri acetati, *Dub.* Pulvis aloet cum ferro, *Lond.*

FERULA ASSA FOETIDA. *Gummi-reſina.* (*Ed.*) *Aſa fœtida. Gummi-reſina.* (*Lond. Dub.*)

Aſſa fœtida. A gum-reſin.

Willd. g. 539. *ſp.* 11.—*Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

The plant which furniſhes aſſa fœtida is perennial, and a native of Perſia. It has, however, born fertile ſeeds in the open air in the Botanical garden of Edinburgh. The gum-reſin is procured from the roots of plants which are at leaſt four years old. When the leaves begin to decay, the ſtalk is twiſted off, and the earth removed from about their large tapering roots. The top of the root is ſometime afterwards cut off tranſverſely; and forty-eight hours afterwards, the juice, which has exuded, is ſcraped off, and a ſecond tranſverſe ſection is made. This operation is repeated until the root be entirely exhauſted of juice. After being ſcraped off, the juice is expoſed to the ſun to harden.

It is brought to us in large irregular maſſes, compoſed of various little ſhining lumps or grains, which are partly of a whitiſh colour, partly reddiſh, and partly of a violet hue. Thoſe maſſes are accounted the beſt which are clear, of a pale reddiſh colour, and variegated with a great number of elegant white tears.

This drug has a ſtrong fetid ſmell, ſomewhat like that of garlic; and a bitter, acrid, biting taſte. It loſes ſome of its ſmell and ſtrength by keeping: a circumſtance to be particularly regarded in its exhibition.

Neumann got from 1920 parts, 1350 alcoholic extract, and afterwards 190 watery, and inverſely 550 watery. The ſmell reſides entirely in an eſſential oil which riſes in diſtillation, both with alcohol and water. Neumann got more than 60 from 1920 grains.

Medical uſe.—It is the moſt powerful of all the fetid gums, and is a moſt valuable remedy. It acts as a ſtimulant, antiſpaſmodic, expectorant, emmenagogue and anthelmintic. Its action is quick and penetrating.

It is often ſerviceable,

1. In croup.
2. In dyſpepſia, amenorrhœa and chloroſis.
3. In aſthma, dyſpnœa and hyſteria.
4. In tympanites and worms.

It is exhibited,

1. In ſubſtance, in the form of pills; in doſes of from five to twenty grains, either alone, or combined with bitter extracts or purgatives.
2. Diſſolved in ſome ſimple diſtilled water.
3. Diſſolved in alcohol.
4. In the form of clyſter, to the extent of about two drachms.

Off. prep.—Aſſa fœt. pur. *Lond.* Lac aſſæ fœtidæ, *Lond.* Tinctura, *Ed. Lond. Dub.* Tinct. caſt. comp. *Ed.* Spiritus ammon. fœtid. *Ed. Lond. Dub.* Pil. aloes cum aſſa fœt. *Ed.* Pil. aſſa fœt. comp. *Ed.* Pil. galb. comp. *Lond.* Emp. aſſæ fœt. *Lond.*

FICUS CARICA. *Fructus.* (*Ed.*) *Carica. Fructus.* (*Lond. Dub.*)

The fig-tree. The fruit.

Polygamia Triœcia.—Nat. ord. *Scabridæ.*

This tree is probably a native of Aſia, but grows plentifully in the ſouth of Europe. As the fruit is very pulpy, it is dried when it is to be preſerved. To this country they are chiefly brought from the Levant. They conſiſt almoſt entirely of ſugar and mucilage, and are therefore demulcent. They are alſo eſteemed by ſome as ſuppuratives; and they are ſometimes applied by themſelves, heated as warm as they can eaſily be borne, to promote the ſuppuration of a phlegmon, particularly when ſo ſituated that other cataplaſms cannot eaſily be kept applied.

Off. prep.—Decoct. hord. comp. *Lond.* Elect. ſennæ, *Ed. Lond.*

FRAXINUS ORNUS. *Succus concretus.* (*Ed.*) *Manna.* (*Lond. Dub.*)

Manna-aſh. The concrete juice. Manna.

Polygamia Diœcia.—Nat. ord. *Aſcyroideæ.*

Manna is obtained from other ſpecies of fraxinus beſides the ornus, and eſpecially from the rotundifolia. It is principally collected in Calabria, Apulia and Sicily. In the warmeſt ſeaſon of the year, from the middle of June to the end of July, a clear juice exudes from the ſtem and branches of theſe trees, which, when naturally concreted on the plants and ſcraped off, is called Manna in the tear; but if allowed to exude on ſtraws, or chips of wood faſtened to the tree, it is called Canulated or flaky manna. The common, or fat manna, is got by inciſions made after the ſpontaneous exudation is over, and is in larger maſſes and of a redder colour. The beſt Calabrian manna is in oblong, light, friable pieces or flakes, of a whitiſh or pale yellow colour, and ſomewhat tranſparent. The inferior kinds are moiſt, unctuous, and dark coloured. Manna is ſaid to be ſometimes counterfeited by a compoſition of ſugar and honey, mixed with a little ſcammony: there is alſo a factitious manna, which is white and dry, ſaid to be compoſed of ſugar, manna, and ſome purgative ingredient, boiled to a proper conſiſtence: this may be diſtinguiſhed by its weight, ſolidity, untranſparent whiteneſs, and by its taſte, which is different from that of manna.

According to Neumann, manna diſſolves in alcohol. On ſetting the ſolution in a digeſting heat it gradually depoſites $\frac{5}{8}$ of the manna, of a fine white colour, light, ſpongy, and in ſome degree cryſtalline, melting inſtantly upon the tongue, and impreſſing an agreeable ſweet taſte, without any of the nauſeouſneſs of the manna: by further evaporation $\frac{1}{4}$ more is obtained ſimilar to manna; and on continuing the evaporation, a thick extract is formed, of the conſiſtence of a balſam, which can ſcarcely be fully exſiccated, but continues moiſt, and reſembles civet grown brown by age. In this extract, which is about one eighth, reſides all the nauſeous matter of the manna. It has indeed a degree of ſweetiſh taſte, but blended with a diſguſtful. The experiments which I have made verify theſe obſervations. The quantity of matter which a hot alcoholic ſolution of manna depoſites on cooling is various, a ſaturated ſolution concretes into a perfectly dry, white, ſpongy, cryſtallized maſs. When much leſs concentrated, it depoſites a congeries of moſt beautiful ſnow white acicular cryſtals. A ſaturated ſolution in boiling water alſo forms a ſolid cryſtallized maſs on cooling. It is therefore evident that manna cannot be a ſpecies of ſarcocoll, the only chemical difference between which and ſugar, ſtated by Dr. Thomſon, is its want of cryſtallizability.

Med. uſe.—Manna is a mild, agreeable laxative, and may be given with ſafety to children and pregnant women: nevertheleſs in ſome particular conſtitutions, it acts very unkindly, producing flatulency and diſtention of the viſcera: theſe inconveniences may be prevented by the addition of any grateful warm aromatic. Manna operates ſo weakly as not to produce the full effect of a cathartic, unleſs taken in large doſes; and hence it is rarely given with this intention by itſelf. It may be commodiouſly diſſolved in the purging mineral waters, or joined to the cathartic ſalts, ſenna, rhubarb, or the like.

Off. prep.—Syr. mannæ, *Dub.* Elect. caſſiæ, *Ed. Lond. Dub.*

FULIGO LIGNI COMBUSTI. (*Dub.*)

Wood-ſoot.

THIS ſubſtance is inflammable, of a ſhining black colour, a diſagreeable ſmell, and an empyreumatic, bitter, nauſeous taſte.

It varies ſomewhat according to the nature of the ſubſtance, and the ſtrength of the fire employed in its production. But it conſiſts principally of charcoal, empyreumatic oil, and acetous acid. It ſometimes contains ammonia, and the other alkalies and earths. Its medical properties are to be aſcribed ſolely to the empyreumatic oil it contains.

FUMARIA OFFICINALIS. *Fumaria. Herba.* (*Dub.*)

Common fumitory. The plant.

Diadelphia Hexandria.—Nat. ord. *Lomentaceæ.*

THIS is a common annual weed in ſhady cultivated grounds. It is very juicy, of a bitter taſte, without any remarkable ſmell. The alleged medical effects of this herb are, to ſtrengthen the tone of the bowels, gently looſen the belly, and promote the urinary and other natural ſecretions. It is principally recommended in melancholic, ſcorbutic, and cutaneous diſorders.

GENTIANA LUTEA. *Radix.* (*Ed.*) *Gentiana. Radix.* (*Lond. Dub.*)

Gentian. The root.

Willd. g. 512. *ſp.* 1.—*Pentandria Digynia,*—Nat. ord. *Rotaceæ.*

GENTIAN is a perennial plant, which grows upon the Alps, Pyrenees, Appenines, and other mountainous ſituations in the temperate parts of Europe.

The roots are long, thick, externally of a brown colour, and wrinkled; internally ſpongy, and of a yellow colour, without any remarkable ſmell, but ſurpaſſing in bitterneſs all other European vegetables. Alcohol diſſolves only the bitter extractive, water both the extractive and mucilage.

Neumann got from 960 grains 390 alcoholic, and afterwards 210 inſipid watery extract, and inverſely 540 watery, and only 20 alcoholic.

Gentian poſſeſſes the general virtues of bitters in an eminent degree, and it is totally devoid of aſtringency. On dead animal matter it acts as an antiſeptic. Taken into the ſtomach, it proves a powerful tonic, and in large doſes it evacuates the inteſtines. It is uſeful in debility of the ſtomach, in general debility, and in gout. Combined with aſtringents it cures intermittents. Externally, it is applied to putrid ulcers.

Off. prep.—Infuſ. g. comp. *Ed. Lond. Dub.* Tinct. g. comp. *Ed. Lond.* Vin. g. comp. *Ed.* Extract gent. *Ed. Lond. Dub.* Tinct. rhei cum gent. *Ed.*

GEOFFRÆA INERMIS. *Cortex.* (*Ed.*) *Geoffroea. Cortex.* (*Dub.*)
Cabbage bark-tree. The bark.
Diadelphia Decandria.—Nat. ord. *Papilianaceæ.*

THE bark of this tree, which grows in the low ſavannahs of Jamaica, is of a grey colour externally, but black and furrowed on the inſide. The powder looks like jalap, but is not ſo heavy. It has a mucilaginous and ſweetiſh taſte, and a diſagreeable ſmell. But its medical effects are much greater than its ſenſible qualities would lead us to expect.

It is given in caſes of worms, in form of powder, decoction, ſyrup, and extract. The decoction is preferred; and is made by ſlowly boiling an ounce of the freſh dried bark in a quart of water, till it aſſume the colour of Madeira wine. This ſweetened, is the ſyrup; evaporated, it forms an extract. It commonly produces ſome ſickneſs and purging; ſometimes violent effects, as vomiting, delirium, and fever. Theſe laſt are ſaid to be owing to an overdoſe, or to drinking cold water; and are relieved by the uſe of warm water, caſtor oil, or a vegetable acid. It ſhould always be begun in ſmall doſes; and when properly and cautiouſly adminiſtered, it operates as a very powerful anthelmintic, particularly for the expulſion of the lumbrici, which are a very common cauſe of diſeaſe in the Weſt-India iſlands; and there it is very frequently employed.

Off. prep.—Decoct. *Ed.*

GLYCYRRHIZA GLABRA. *Radix. Extractum.* (*Ed.*) *Glycyrrhiza. Radix.* (*Lond. Dub.*)
Liquorice. The root and the extract.
Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*

LIQUORICE is a perennial plant, and a native of the ſouth of Europe, but it is cultivated in conſiderable quantities in England for medical purpoſes; and the roots which are raiſed in this country, are preferred to thoſe imported from abroad, which are very frequently mouldy and ſpoiled, which this root is extremely apt to be when not well preſerved in a perfectly dry place. The roots are very long, about an inch thick, flexible, fibrous, externally of a brown colour, internally yellow, and, when freſh, juicy. Their taſte is very ſweet, combined with a ſlight degree of bitter, when long kept in the mouth. They are prepared for uſe by peeling them, cutting away all the fibres and ſpoiled or mouldy parts.

The powder of liquorice uſually ſold is often mingled with flower, and perhaps alſo with ſubſtances not quite ſo wholeſome: the beſt ſort is of a browniſh yellow colour, the fine pale yellow being generally ſophiſticated, and it is of a very rich ſweet taſte, much more agreeable than that of the freſh root.

Neumann got from 966 parts of dried liquorice, 300 alcoholic extract, and afterwards 210 watery, and inverſely 540 watery, and only 30 alcoholic. The original alcoholic extract is the ſweeteſt.

Medical uſe.—Its predominant conſtituents being ſaccharine and mucilaginous matter, its only action is that of a mild demulcent, and as ſuch it is frequently uſed in catarrh, and in ſome ſtomach-complaints, which ſeem to ariſe from a deficiency of the natural mucus, which ſhould defend the ſtomach againſt the acrimony of the food, and the fluids ſecreted into it.

On account of its bulk it is rarely exhibited in ſubſtance, but more frequently in infuſion or decoction.

Off. prep.—Extract. glyc. *Ed. Lond. Dub.* Decoct. daph. mezer. *Ed.* Decoct. guaiaci comp. *Ed.* Decoct. hord. comp. *Lond.* Decoct. ſarſ. comp. *Lond. Dub.* Elect. ſennæ, *Lond. Ed.* Trochiſci amyli, *Lond.* Tinct. rhub. comp. *Lond.* Pil. hydrarg. *Lond. Dub.*

EXTRACTUM GLYCYRRHIZÆ GLABRÆ. (*Ed.*)

As this extract is never prepared by the apothecary, but commonly imported from other countries, the Edinburgh college have inſerted it in their liſt of materia medica. It is imported in cylindrical rolls, covered with bay-leaves. It ſhould be perfectly black, brittle when cold, and break with a ſmooth and gloſſy fracture, have a ſweet taſte, without empyreuma, and be entirely ſoluble in water. It is prepared from the freſh roots by expreſſion, decoction and inſpiſſation.

The beſt foreign extract of liquorice is prepared in Catalonia, but it is not ſo pure or ſo agreeable as the refined liquorice ſold in the ſhops in ſmall cylindrical pieces, not thicker than a gooſe-quill.

Neumann got from 480 parts of Spaniſh extract 460 watery extract, and the reſiduum was not affected by alcohol, and inverſely he got 280 alcoholic, and 180 watery extract. In this laſt caſe the alcoholic extract contained all the ſweetneſs, the watery having ſcarcely any taſte. From the ſimilarity of their taſte, Dr. Thomſon has made it a ſpecies of his new genus ſarcocoll, but Neumann's more accurate analyſis ſhews that it is a compound.

The extract poſſeſſes the ſame properties with the root, and is uſed for the formation of ſeveral kinds of troches.

Off. prep.—Tinctura aloes, *Ed. Dub. Lond.* Trochiſci, *Lond. Dub. Ed.* Trochiſci cum opio, *Ed. Dub.*

GRATIOLA OFFICINALIS. *Herba.* (*Ed.*) *Gratiola. Herba.* (*Lond.*)

Hedge-hyſſop. The plant.

Willd. g. 49. *ſp.* 1.—*Diandria Monogynia.*—Nat. ord. *Perſonatæ.*

THIS is a perennial plant, a native of marſhy ſituations in the ſouth of Europe. It is gathered for uſe when in flower. It has no ſmell, but a very bitter ſomewhat nauſeous taſte. It is a draſtic purgative and emetic, and a very powerful anthelmintic, but its uſe requires caution. In ſubſtance it may be given to the extent of half a drachm, and in infuſion to three drachms.

GUAJACUM OFFICINALE. *Lignum, Gummi-reſina.* (*Ed.*) *Guaiacum. Lignum. Cortex. Gummi-reſina.* (*Lond.*) *Lignum. Gummi-reſina.* (*Dub.*)

Guaiac. The wood, bark, and gum-reſin.

Willd. g. 819. *ſp.* 2.—*Decandria Monogynia.*—Nat. ord. *Gruinales.*

THIS tree is a native of the Weſt-Indies, where it grows to a middling ſize. The wood is heavier than water, very hard, reſinous, and of a greeniſh-black colour. Its taſte is bitteriſh, and when kindled it gives out a pleaſant ſmell. It is brought either in pieces, which are ſometimes covered with a pale yellow alburnum, or already raſped, when by diviſion its colour appears greeniſh, brown, or yellow. The bark is thin, of an aſh-grey or blackiſh colour, and apparently compoſed of ſeveral laminæ. It is leſs reſinous than the wood. Neumann got from 7680 parts of the wood 1680 alcoholic, and 280 watery extract, and inverſely 740 watery, and 960 alcoholic; from 3840 of the bark he got 560 alcoholic, and 320 watery, and inverſely 620 watery, and 240 alcoholic. The reſin exudes ſpontaneouſly in tears, but is principally obtained by ſawing the wood into billets about three feet long, which are then bored with an augre longitudinally. One end of theſe is laid upon a fire, ſo that a calabaſh may receive the melted reſin, which runs through the hole as the wood burns. It may be alſo obtained by boiling the chips or ſawings of the wood in water and muriate of ſoda. The reſin ſwims at the top, and may be ſkimmed off. This reſin has a browniſh yellow colour externally; when held againſt the light is tranſparent, breaks with a uniform ſmooth ſhining fracture, of a bluiſh-green colour, pulverizable, powder of a white colour, gradually becoming bluiſh-green, fuſible in a moderate heat, but not ſoftened by the heat of the fingers, ſoluble in alcohol, inſoluble in water, (Neumann got from 480 parts 400 alcoholic, and only 10 watery extract, and inverſely 80 watery, and 280 alcoholic), without proper ſmell or taſte, but when thrown on hot coals diffuſing an agreeable odour, and when ſwallowed in a ſtate of minute diviſion, cauſing an inſufferable burning and prickling in the throat. It therefore is not a gummy-reſin, but a pure reſin. It is ſometimes adulterated with colophony or common reſin, but the fraud is eaſily detected by the ſmell of turpentine which they emit when thrown on live coals.

Medical uſe.—Taken internally, guaiac commonly excites a ſenſe of warmth in the ſtomach, a dryneſs of the mouth, with thirſt. It increaſes the heat of the body, and quickens the circulation. If the patient be kept warm, it produces diaphoreſis; if expoſed freely to the air, an increaſed flow of urine. In large doſes it is purgative.

Guaiac is a uſeful remedy,

1. In rheumatiſm and gout.
2. In certain venereal ſymptoms, as in foul indolent ulcers, and a thickened ſtate of the ligaments or perioſteum, remaining after the body is reduced by a mercurial courſe. Guaiac will alſo ſuſpend the progreſs of ſome of the ſecondary ſymptoms, but it is totally incapable of eradicating the diſeaſe.
3. In cutaneous diſeaſes.
4. In ozæna and ſcrofulous affections of the membranes and ligaments.

The wood is always exhibited in decoction. From the reſinous nature of the active conſtituent of this ſubſtance, this cannot be a very active preparation, as the menſtruum is totally incapable of diſſolving, though it may ſuſpend a little of the reſin. The decoction of an ounce may be drunk in cupfuls in the courſe of a day.

The reſin may be exhibited,

1. In ſubſtance, either made into pills, or ſuſpended in water in the form of an emulſion. In this way from 10 to 30 grains of the reſin may be taken in the day.
2. In ſolution; in alcohol. About half an ounce of the tincture, with three ounces of water, is a ſudorific doſe for an adult, if he attend to keeping himſelf warm.
3. Combined with an alkali.

Off. prep.—Tinct. *Ed.* Tinct. guaic. ammon. *Ed. Lond. Dub.*

Pulv. aloet cum guaic. *Lond.* Decoct. comp. *Ed.* Decoct. ſarſ. comp. *Lond. Dub.*

HÆMATOXYLON CAMPECHIANUM. *Lignum.* (*Ed.*) *Hæmatoxylum. Lignum.* (*Lond. Dub.*)

Logwood-tree. The wood.

Willd. g. 830. *ſp.* 1.—*Decandria Monogynia.*—Nat. ord. *Lomentaceæ.*

THIS tree was introduced from the Honduras into Jamaica, where it is now very common. The wood is firm, heavy, and of a dark red colour. Its taſte is ſweet, with a ſlight degree of aſtringency. It forms a precipitate with ſolution of gelatine, very readily ſoluble in exceſs of gelatine, and with ſulphate of iron it ſtrikes a brighter blue than any other aſtringent I have tried. It is uſed principally as a dye-wood, but alſo with conſiderable advantage in medicine.

Its extract is alſo ſweet and ſlightly aſtringent; and is, therefore, uſeful in obſtinate diarrhœas, and in chronic dyſentery.

HELLEBORUS.

Willd. g. 1089.—*Polyandria Polygynia.*—Nat. ord. *Multiſiliquæ.*

Sp. 2. HELLEBORUS NIGER. *Radix.* (*Ed. Lond. Dub.*) *Melampodium.*

Black Hellebore. The root.

THIS plant is perennial, and grows wild in the mountainous parts of Auſtria, and on the Pyrenees and Appenines: the earlineſs of its flowers, which ſometimes appear in December, has gained it a place in our gardens.

The roots conſiſt of a black furrowed roundiſh head, about the ſize of a nutmeg, from which ſhort articulated branches ariſe, ſending out numerous corrugated fibres, about the thickneſs of a ſtraw, from a ſpan to a foot in length, deep brown on the outſide, white, or yellowiſh-white within, and of an acrid, nauſeous and bitteriſh taſte, exciting a ſenſe of heat and numbneſs in the tongue, and of a nauſeous acrid ſmell. Theſe fibres only are uſed in medicine, and the head and decayed parts are rejected. For the roots of the real black hellebore, the roots of the Adonis vernalis, Trollius Europæus, Actæa ſpicata, Aſtrantia major, Helleborus viridis fœtidus, Veratrum album, and Aconitum neomontanum, are often ſubſtituted. The laſt is a moſt virulent poiſon, and may be diſtinguiſhed by its roots being fuſiform, or nearly globular, ſending out numerous very brittle fibres, of a greyiſh black or brown colour, as thick as a man's finger, and repeatedly divided. But the ſureſt way to avoid miſtakes, is by the apothecary cultivating the plant itſelf in his own garden.

Neumann got from 2880 grains 380 alcoholic, and 181 watery extract, and inverſely 362 watery and 181 alcoholic.

In large doſes, hellebore is a draſtic purgative; in ſmaller doſes it is diuretic and emmenagogue. Its active conſtituent ſeems to be of a volatile nature; for it loſes its virtues by keeping, and water diſtilled from it has an acrid taſte.

It is principally uſed as a purgative in caſes of mania, melancholy, coma, dropſy, worms and pſora, and as an emmenagogue. But its uſe requires very great caution, for its effects are very uncertain, and affected by many circumſtances.

It is commonly exhibited in the form of extract, although its activity be much diſſipated by the preparation. An infuſion or tincture certainly promiſe to be medicines of more uniform powers. Willdenow ſays, that the black hellebore of the ancients is his fifth ſpecies, the Helleborus orientalis.

Off. prep.—Tinct. *Lond. Dub. Ed.*

Sp. 6. HELLEBORUS FOETIDUS. *Helleboraſter. Folium.* (*Lond.*)
Bears-foot. The leaves.

THIS ſpecies is native of England. It is perennial, and grows in ſhady places, and under hedges. The leaves have an acrid, bitter, nauſeous taſte, and unpleaſant ſmell, eſpecially when they are freſh. When dried, they are frequently given as a domeſtic medicine to deſtroy worms; but they muſt be uſed ſparingly, being ſo violent in their operation that inſtances of their fatal effects are recorded.

HORDEUM DISTICHON. *Semen omni cortice nudatum.* (*Ed.*) *Hordeum diſtichum. Semina.* (*Dub.*) *Hordeum. Semen.* (*Lond.*)
Barley. The ſeed. Pearl barley.
Willd. g. 151. *ſp.* 3. *Triandria Digynia.*—Nat. ord. *Gramina.*

BARLEY is an annual plant, cultivated in almoſt every country of Europe. Linnæus ſays that it is a native of Tartary, but without adducing ſufficient proof.

Pearl barley is prepared by grinding off the huſk of rough barley, and forming the grain into little round granules, which appear of a kind of pearly whiteneſs. In this ſtate barley conſiſts almoſt ſolely of amylaceous matter, and when boiled forms an excellent article of nouriſhment; while a decoction of it, properly acidulated, is one of the beſt beverages in acute diſeaſes.

Off. prep.—Decoct. *Ed. Lond.*

HYDRARGYRUM. (*Dub.*) *Hydrargyrus.* (*Lond. Ed.*)
Mercury, Quickſilver.

THE general, chemical, and phyſical properties of this metal, have been already enumerated. We ſhall now treat of it more minutely, as forming an important article in the materia medica.

It is found,

I. In its metallic ſtate:
  a. Uncombined.
  b. Alloyed with ſilver.
  c. Alloyed with copper.
  d. Combined with ſulphur, (Cinnabar).
  e. Combined with hydroguretted ſulphur, (Æthiops minerale).

II. Oxidized:
  a. Combined with muriatic acid.
  b. ——————— ſulphuric acid.

There are conſiderable mines of mercury in Hungary and in Spain; and what is employed in England is principally imported from the former country.

Mercury taken into the ſtomach in its metallic ſtate has no action on the body, except what ariſes from its weight or bulk. It is not poiſonous as was vulgarly ſuppoſed, but perfectly inert.

But in its various ſtates of combination, it produces certain ſenſible effects. It quickens the circulation, and increaſes all the ſecretions and excretions. According to circumſtances, the habit of the body of the patient, the temperature in which he is kept, the nature of the preparation, and the quantity in which it is exhibited, its effects are indeed various; it ſometimes increaſes one ſecretion more particularly, ſometimes another, but its moſt characteriſtic effect is the increaſed flow of ſaliva, which it generally excites, if given in ſufficient quantity. Its particular effects, and means of producing each of them, will be noticed hereafter.

From many motives, both laudable and culpable, mercury has been tortured into a greater variety of forms than any other article of the materia medica. Of theſe, Swediaur has given a complete table in the late edition of his works on the venereal diſeaſe. It is too long for inſertion in this place: we ſhall therefore give a ſyſtematic view of thoſe mercurial preparations only which enter at leaſt one of the Britiſh pharmacopœias.

Mercury is exhibited,

I. Purified by diſtillation.
  Hydrargyrum purificatum. (*Dub. Lond. Ed.*)

II. Oxidized;

A. Protoxide.
- 1. By precipitation from its ſolution in nitrous acid, by ammonia.
  - Oxidum hydrargyri cinereum. (*Ed.*)
  - Pulvis hydrargyri cinereus. (*Dub.*)
- 2. By trituration:
  - *a.* With unctuous ſubſtances.
    - Unguentum hydrargyri. (*Ed.*)
    - ———————— fortius. (*Lond. Dub.*)
    - ———————— mitius. (*Lond. Dub.*)
    - Emplaſtrum ammoniaci cum hydrargyro. (*Lond.*)
    - ———— lithargyri cum hydrargyro. (*Lond.*)
    - ———— hydrargyri. (*Ed.*)
  - *b.* With ſaccharine ſubſtances.
    - Pilulæ hydrargyri. (*Lond. Dub. Ed.*)
  - *c.* With carbonate of lime.
    - Hydrargyrus cum creta. (*Lond.*)

III. Oxidized;

B. Peroxide.
- 1. By the action of heat and air.
  - Hydrargyrum calcinatum. (*Lond. Dub.*)
- 2. By the action of nitrous acid.
  - Oxidum hydrarg. rubrum per acidum nitricum. (*Ed.*)
  - Hydrargyrum ſub-nitratum. (*Dub.*)
  - Hydrargyrus nitratus ruber. (*Lond.*)
    - Unguentum oxidi hydrargyri rubri. (*Ed.*)

IV. Oxidized and combined with acids:

A. Protoxide.
- 1. With nitrous acid:
  - Unguentum hydrargyri nitrati. (*Lond. Dub. Ed.*)
- 2. With ſulphuric acid:
  - Sub-ſulphas hydrargyri flavus. (*Ed.*)
  - Hydrargyrum ſub-vitriolatum. (*Dub.*) ?
  - Hydrargyrus vitriolatus. (*Lond.*)
- 3. With muriatic acid:
  - *a.* By ſublimation.
    - Sub-murias hydrargyri. (*Ed.*)
    - Hydrargyrum muriatum mite ſublimatum. (*Dub.*)
    - Calomelas. (*Lond.*)
  - *b.* By precipitation.
    - Sub-murias hydrargyri præcipitatus. (*Ed.*)
    - Hydrarg. muriat. mite præc. (*Dub.*)
    - Hydrargyrus muriatis mitis. (*Lond.*)
- 4. With acetous acid:

Acetis hydrargyri. (*Ed.*)
Hydrargyrum acetatum. (*Lond. Dub.*)
B. Peroxide.
1. Muriate.
Murias hydrargyri. (*Ed.*)
Hydrargyrus muriatus. (*Lond.*)
Hydrargyrum muriatum corroſivum. (*Dub.*)
2. Sub-muriate with ammonia.
Calx hydrargyri alba. (*Lond.*)

V. Combined with ſulphur:
1. By trituration.
Sulphuretum hydrargyri nigrum. (*Ed.*) Hydr. cum ſulph. (*Lond.*)
Hydrargyrum ſulphuratum nigrum. (*Dub.*)
2. By ſublimation.
Hydrargyrum ſulphuratum rubrum. (*Lond. Dub.*)

Mercury, or ſome of its preparations, is exhibited,
1. As an errhine. The ſub-ſulphate of mercury.
2. As a ſialogogue. Mercury in almoſt any form.
3. As a cathartic. The ſub-muriate of mercury, (calomel).
4. As a diuretic. The oxides, the muriate, and the ſub-muriate, combined with other diuretics.
5. As a ſudorific. Calomel conjoined with a ſudorific regimen.
6. As an emmenagogue.
7. As an aſtringent. Muriate of mercury.
8. As a ſtimulant. Muriate of mercury.
9. As an antiſpaſmodic.
10. As an anthelmintic.

With ſome of theſe views, mercury is frequently exhibited,
1. In febrile diſeaſes; in obſtinate agues.
2. In inflammatory diſeaſes; in indolent and chronic inflammations, eſpecially of the glandular viſcera, as the liver, ſpleen, &c.
3. In exanthematous diſeaſes; variola.
4. In profluvia; in dyſentery.
5. In ſpaſmodic diſeaſes; tetanus, triſmus, hydrophobia, &c.
6. In cachectic diſeaſes; anaſarca, aſcites, hydrothorax, hydrocephalus, &c.
7. In impetigines; ſcrofula, ſyphilis, lepra, icterus, &c.
8. In local diſeaſes; in caligo corneæ, amauroſis, gonorrhœa,

obſtipatio, amenorrhœa ſuppreſſionis, tumours of various kinds, herpes, tinea, pſora, &c.

Mercury occaſionally attacks the bowels, and cauſes violent purging, even of blood. This effect is remedied by intermitting the uſe of the medicine, and by exhibiting opium.

At other times it is ſuddenly determined to the mouth, and produces inflammation, ulceration, and an exceſſive flow of ſaliva. In this caſe, too, the uſe of the mercury muſt be diſcontinued for a time; while, according to Mr. Pearſon's advice, the patient ſhould be freely expoſed to a dry cold air, with the occaſional uſe of cathartics, Peruvian bark, and mineral acids, and the aſſiduous application of aſtringent gargles. On the other hand, the ſudden ſuppreſſion of ptyaliſm is not without danger. It is moſt frequently cauſed by cold liquids being taken into the ſtomach, or expoſure to cold and moiſture, while under the influence of mercury. The danger is to be obviated by the quick introduction of mercury, ſo as to affect the gums, with the occaſional uſe of the warm-bath.

Sometimes alſo a morbid condition of the ſyſtem occurs during a mercurial courſe, and which tends to a fatal iſſue. Mr. Pearſon has termed it Erethiſmus. It is characterized by great depreſſions of ſtrength; a ſenſe of anxiety about the præcordia; frequent ſighing; trembling, partial or univerſal; a ſmall, quick pulſe; ſometimes vomiting; a pale contracted countenance; a ſenſe of coldneſs, while the tongue is ſeldom furred, or the vital or natural functions much diſordered. In this ſtate a ſudden or violent exertion of muſcular power will ſometimes prove fatal. To prevent dangerous conſequences, the mercury muſt be diſcontinued, whatever may be the ſtage, extent, or violence of the diſeaſe for which it has been exhibited, and the patient muſt expoſe himſelf freely to a dry and cool air, in ſuch a manner as ſhall be attended with the leaſt fatigue; and in the courſe of ten or fourteen days, he will ſometimes be ſo far recovered that he may ſafely reſume the uſe of mercury.

HYOSCYAMUS NIGER. *Herba. Semen.* (*Ed.*) *Hyoſcyamus. Herba. Semen.* (*Dub.*)

Black henbane. The herb and ſeeds.

Willd. g. 378. *ſp.* 1.—*Pentandria Monogynia.*—Nat. ord. *Solanaceæ.*

Henbane is a biennial plant, which grows in great abundance in moſt parts of Britain.

The ſmell of the hyoſcyamus is ſtrong and peculiar: and the leaves when bruiſed emit ſomewhat of the odour of tobacco. This ſmell is ſtill ſtronger when the leaves are burnt; and on burning they ſparkle with a deflagration ſomewhat reſembling that of nitre.

but to the taſte they ſhew no evident ſaline impregnation. When chewed, they are inſipid, mild, and mucilaginous: yet when taken to any great extent, they produce the moſt alarming effects. They give the appearances of intoxication, attended with wild delirium, remarkable dilatation of the pupils of the eyes, and convulſions. It often produces ſweat, and ſometimes an eruption of puſtules over the ſurface, and generally ſound ſleep, ſucceeded by ſerenity of mind, and recruited vigour of the body: but like the other narcotics, inſtead of theſe, it ſometimes gives riſe to vertigo, headach, and general uneaſineſs. With particular individuals it occaſions vomiting, colic pains, a copious flow of urine, and ſometimes purging. Upon the whole, like opium, it is a powerful anodyne; and like cicuta, it is free from any conſtipating effect, having rather a tendency to move the belly.

Med. uſe.—From theſe effects, it is not ſurpriſing that hyoſcyamus ſhould have been introduced into the practice of medicine; and accordingly, it appears to have been uſed both externally and internally for a variety of purpoſes. Several different ſpecies of the hyoſcyamus were formerly employed, as appears from the writings of Dioſcorides and others. Celſus, in particular, was very fond of this medicine; he uſed it externally as a collyrium in caſes of opthalmia: he employed it topically for allaying the pain of toothach; and he gave it internally, both with the view of mitigating other pains, and of producing quiet ſleep.

For a conſiderable length of time, however, hyoſcyamus fell almoſt into diſuſe; but the employment of it has of late been revived by Dr. Störk of Vienna; and it has been uſed both by him, and by many other practitioners in thoſe caſes where an anodoyne is requiſite, and where there are objections to the uſe of opium. It is employed for reſolving ſwelling, and allaying pain in caſes of ſcirrhus, under the form of cataplaſm of the leaves, or of a plaſter made from the oil of the ſeeds and powder of the herb, with wax, turpentine, and other articles; or of ointment made of the powder of the leaves with hogs lard. In open ulcers, the powder of the leaves, ſprinkled on the part, has often a good effect.

An extract from the leaves, or from the ſeeds, is the form in which it is given internally; but contrary to what happens with cicuta, the former appears to be the moſt powerful. This extract has been given with advantage in a variety of nervous affections, as mania, melancholia, epilepſy, hyſteria, &c.; in glandular ſwellings, in obſtinate ulcerations; and in every caſe where it is neceſſary either to allay inordinate action, or mitigate pain. In accompliſhing theſe ends, it is often no leſs uſeful than opium; and it frequently ſucceeds where opium produces very diſagreeable effects. The doſe of this extract muſt be accommodated to the circumſtances of the caſe and of the patient; and it has been increaſed from half a grain to half a drachm in the day; for like opium, its influence is very much diminiſhed by habit.

Off. prep.—Succus ſpiſſat. *Ed.* Tinct. *Ed.*

HYPERICUM PERFORATUM. *Hypericum. Flos.* (*Lond.*)
Common St. John's wort. The flower.
Polyadelphia Polyandria.—Nat. ord. *Aſcyroideæ.*

THIS plant is perennial, and grows wild in woods and uncultivated places in Britain. Its taſte is rough and bitteriſh, and its ſmell diſagreeable. It abounds with veſicles, containing a tranſparent matter, ſo that when viewed, by holding the plant between the eye and the light, they reſemble perforations. From the freſh flower buds, a red juice may be expreſſed, which imparts its colour to alcohol water and fixed oils. The red colour of the infuſion is brightened by acids, and is changed to black by ſulphate of iron. Neumann got from 480 grains, 300 of watery, and 40 of alcoholic, extract, and inverſely 240 alcoholic, and 120 watery. Nothing conſiderable aroſe in diſtillation with either water or alcohol.

HYSSOPUS OFFICINALIS. *Herba.* (*Edin.*) *Hyſſopus. Folia.* (*Dub.*)
Hyſſop. The herb.
Willd. g. 1096. *ſp.* 1.—*Didynamia Gymnoſpermia.*—Nat. ord. *Verticillatæ.*

HYSSOP is a perennial herb, which grows wild in Germany.

The leaves of hyſſop have an aromatic ſmell, and a warm pungent taſte. Their virtues depend entirely on an eſſential oil which riſes in diſtillation both with water and alcohol. Beſides the general virtues of aromatics, they were formerly recommended in humoral aſthmas, coughs, and other diſorders of the breaſt and lungs, and were ſaid to promote expectoration.

INULA HELENIUM. *Enula campana. Radix.* (*Dub. Lond.*)
Elecampane. The root.
Syngeneſia Superflua.—Nat. ord. *Compoſitæ radiatæ.*

This is a very large downy perennial plant, ſometimes found wild in moiſt rich ſoils. The root, eſpecially when dry, has an agreeable aromatic ſmell: its taſte, on firſt chewing, is glutinous and as it were ſomewhat rancid; in a little time it diſcovers an aromatic bitterneſs, which by degrees becomes conſiderably acrid and pungent.

Newmann got from 480 grains of the dry root 390 watery, and 5 alcoholic extract, and inverſely 150 alcoholic, and 300 watery. In diſtillation alcohol elevated nothing, but the diſtilled water was firſt obſerved by Geoffroy to be milky, and mixed with flocculi of a cineritious concrete volatile oil, partly ſwimming, and partly ſinking in the water. He alſo aſcertained that it was fuſible, and compares it to camphor or benzoic acid. Neumann likewiſe examined it, and conſiders it as a peculiar ſubſtance, having ſome reſemblance to camphor. He found that it melts with a gentle heat, and when cold, appears ſofter and more unctious; that it never aſſumes a cryſtalline form, but when dry proves opaque and crumbly; that laid on burning coals it totally exhales, that it is ſoluble in alcohol, but inſoluble in water; and that by keeping it gradually loſes the ſmell of elecampane.

Med. uſe.—It is a gently ſtimulating medicine, nearly ſimilar in its action to angelica. The extract is merely a ſlight bitter, as the eſſential oil is totally diſſipated in the preparation.

IRIS.

Willd. g. 97. *Triandria Monogynia.*—Nat. ord. *Enſatæ.*

Sp. 7. Iris Florentina. *Radix.* (*Ed.*) *Iris. Radix.* (*Lond.*)
Florentine Orris. The root.

This is a perennial plant, a native of the ſouth of Europe. The dried roots are imported from Italy. They are white, flattiſh, knotty, and have a very ſlightly bitter taſte, and an agreeable ſmell, reſembling that of violets.

Neumann got from 480 parts, 77 alcoholic, and afterwards 100 watery, and inverſely 180 watery, and 8 alcoholic. The diſtilled water ſmells a little of the root, but exhibits no appearance of oil. They are chiefly uſed as a perfume.

Off. prep.—Troch. amyli, *Lond.*

Sp. 24. Iris Pseudacorus. *Iris. Radix.* (*Dub.*)
Water-flag. The root.

This plant is perennial, and grows in great abundance by the brinks of rivers, and in other watery places: the root has an acrid taſte; and when freſh, is ſtrongly cathartic.

Med. uſe.—The expreſſed juice, given to the quantity of ſixty or eighty drops every hour or two, and occaſionally increaſed, has been productive of very copious evacuations, after jalap, gamboge, and other ſtrong purgatives had proved ineffectual; and it is in this form only that it is uſed; for by drying, it entirely loſes its purgative effects.

We have here another proof of the neceſſity of denominating the officinal vegetables by their ſyſtematic names; for in England, *Radix Iridis* is a pleaſant perfume, in Ireland a draſtic purgative; and as conſultations are not unfrequently ſent from the one country to the other, ignorance of this circumſtance might give riſe to unpleaſant conſequences.

ISIS NOBILIS. *Corallium Rubrum.* (*Lond.*)
Red coral.

THIS is the axis of a zoophyte of the order of ceratophyta. It is found only in the Mediterranean ſea, and the ſentient fleſh is rubbed off by means of pumice-ſtone. The coral thus prepared is of a ſcarlet or pale red colour, and ſuſceptible of a high poliſh. As an article in medicine, it is to be regarded merely as an indurated carbonate of lime.

Off. prep.—Corall. ppt. *Lond.* Pulv. chel. cancri comp. *Lond.*

JUGLANS REGIA. *Juglans. Fructus Immaturus.* (*Lond.*)
The walnut-tree. The unripe fruit.
Monoecia Polyandria.—Nat. ord. *Amentaceæ.*

THIS beautiful tree, although a native of Perſia, grows to a very large ſize, and produces ripe fruit in moſt parts of England. The fruit conſiſts of a thick, fleſhy, green, ſmooth rind, which incloſes the proper nut. When unripe, they have a peculiar ſmell, and a bitteriſh aſtringent taſte.

Medical uſe.—They have been ſuppoſed to poſſeſs tonic and anthelmintic virtues. The green rind has been celebrated as a powerful anti-venereal remedy; but it poſſeſſes no real anti-ſyphilitic virtues, although it forms a very uſeful addition to the compound decoction of ſarſaparilla, where pains of the limbs and indurations of the membranes remain after the venereal diſeaſe has been cured by mercury, and in many of thoſe cutaneous diſeaſes which are attended with aridity of the ſkin. A decoction of the green rind has alſo been recommended as a uſeful application to old ulcers.

JUNIPERUS.
Dioecia Monadelphia.—Nat. ord. *Coniferæ.*

Sp. JUNIPERUS COMMUNIS. *Baccæ.* (*Ed.*) *Juniperus. Baccæ, Cacumen.* (*Lond.*) *Bacca.* (*Dub.*)
Juniper. The berries and tops.

THIS is an ever-green ſhrub, growing on heaths and hilly grounds in all parts of Europe: the berries are brought from Holland and from Italy. The Italian berries are in general reckoned the beſt. Juniper berries have a ſtrong not diſagreeable ſmell, and a warm pungent ſweet taſte, which if they are long chewed, or previouſly well bruiſed, is followed by a bitteriſh one. Their predominant conſtituents are eſſential oil, and a ſweet mucilaginous matter.

Medical uſe.—To the oil they are indebted for their ſtimulating carminative, diaphoretic, and diuretic properties. They are moſt commonly uſed in the form of infuſion, as a diuretic drink in dropſy. The eſſential oil may be ſeparated by diſtillation. It poſſeſſes the ſame properties in a higher degree, and imparts them to ardent ſpirits. The peculiar flavour, and well-known diuretic effects of Hollands, are owing to the oil of Juniper. The decoction and extract are very inert preparations.

Every part of the plant contains the ſame eſſential oil; therefore an infuſion of the tops is likewiſe diuretic. The wood, alſo, was formerly officinal. In warm countries a reſin exudes from the juniper-tree. It is called ſandarac, and is often mixed with maſtich. It is not a pure reſin, for, according to Mr. Gieſe, about one fifth of it is not ſoluble in water or in alcohol, but in ether, reſembling in theſe reſpects copal.

Off. prep.—Ol. volat. *Ed. Lond. Dub.* Spiritus, *Ed. Lond. Dub.*

Sp. JUNIPERUS LYCIA. *Gummi-reſina.* (*Ed.*) *Olibanum. Gummi-reſina.* (*Lond. Dub.*)

Olibanum. A gum-reſin.

OLIBANUM is principally collected in Arabia, and brought from Mecca to Cairo, from whence it is imported into Europe. It conſiſts of tranſparent brittle grains of different ſizes, not larger than a cheſnut, of a red or yellow colour, having little taſte, and a peculiar aromatic ſmell. Neumann got from 480 grains, 346 alcoholic, and 125 watery extract, and inverſely 200 watery, and 273 alcoholic. The diſtilled ſpirit and oil both ſmelt of olibanum, but no oil ſeparated. It forms a tranſparent ſolution with alcohol, and a milky fluid when triturated with water, it is not fuſible, but inflammable, and burns with an agreeable ſmell. It is the frankincenſe of the ancients; and the diffuſion of its vapour around the altar ſtill forms part of the ceremonies of the Greek and Roman Catholic churches.

Sp. JUNIPERUS SABINA. *Folia.* (*Ed.*) *Sabina. Folium.* (*Lond. Dub.*)

Savine. The leaf.

THIS is an evergreen ſhrub, a native of Siberia and Tartary, but not unfrequent in our gardens. The leaves have a bitter, acrid, biting taſte, and a ſtrong diſagreeable ſmell: diſtilled with water, they yield an eſſential oil, in conſiderable quantity.

Medical uſe.—Savine is a warm ſtimulating medicine, capable of producing diaphoreſis, and increaſing all the ſecretions, but apt to excite hæmorrhagy, eſpecially from the uterus. It is alſo recommended as an anthelmintic, and ſaid to be very efficient in the cure of gout.

Internally, a conſerve of the freſh leaves is exhibited in doſes of from half a drachm to a drachm.

Externally, the leaves are applied in the form of powder or infuſion, to warts, carious bones, and old ulcers; and in caſes of gangrene, pſora, and tinea. The eſſential oil is a very active remedy.

Off. prep.—Ol. volat. *Ed. Dub.*

KÆMPFERIA ROTUNDA. *Zedoaria. Radix.* (*Lond.*)
Round Zedory. The root.
Willd. g. 12. *ſp.* 2. *Monandria Monogynia.*—Nat. ord. *Scitamineæ.*

THIS is a perennial plant, a native of India. The roots are about an inch long, ſomewhat rough on the ſurface, and often terminate in a point. They correſpond in ſenſible qualities with the roots of the amomum zedoaria, but are not ſo ſtrong. By ſome, indeed, they are ſuppoſed to be produced from the ſame plant, and that the round zedoary is the upper, and the long zedoary the under part of the root.

KINO. *Gummi-reſina.* (*Ed.*) *Reſina.* (*Lond. Dub.*) *Gummi rubrum aſtringens Gambienſe.* Fothergill.

I HAVE found in commerce three kinds of kino, eaſily diſtinguiſhed by their external characters.

The firſt is in very ſmall jet black fragments, perfectly opaque, without ſmell, crackling under the teeth when chewed, not colouring the ſaliva, after ſome time imparting only a ſlight aſtringent taſte, not fuſible, and difficultly reduced to powder. Powder dark chocolate brown. Although this has been the longeſt known in commerce in this place, it does not ſeem to be that deſcribed by Fothergill as the produce of the Pau de Sangue, and I have not been able to trace the place of its origin.

The ſecond is in large fragments, on ſome of which the impreſſion of the veſſel into which it had been received while fluid, and in which it had hardened was evident, colour very dark brown, fracture reſinous, appearance homogeneous, with ſmall air bells, in very thin ſplinters tranſparent, and of a ruby red colour, crackling under the teeth when chewed, taſte at firſt ſomewhat acid, but afterwards becoming conſiderably bitter and aſtringent, ſucceeded by a peculiar ſweetneſs, infuſible, and friable; powder of a reddiſh brown. This is ſaid to be the extract of the Coccoloba uvifera, and indeed exactly reſembles ſpecimens certainly known to be ſuch.

The third is in dark brown maſſes of various ſizes, either ſmooth or rounded on the ſurface, or in fragments often covered with a reddiſh brown powder, fracture reſinous and very unequal, appearance ſometimes homogeneous, but more commonly heterogeneous, mixed with bits of twigs, leaves, &c. ſplinters tranſparent, ruby red, no ſmell, ſcarcely crackling under the teeth, but ſometimes gritty from the accidental mixture of ſand, taſte ſimply aſtringent, ſucceeded by ſweetneſs, and, when long chewed, a portion adheres to the teeth; infuſible and friable; powder reddiſh brown. This is certainly obtained from the Eucalyptus reſinifera, or brown gum tree of New-South Wales, by allowing the juice, which either flows from it ſpontaneouſly, or is procured by wounding the tree, to harden in the ſun. Some ſpecimens of it in its fluid ſtate have even reached this country.

The analyſis of kino, publiſhed in the preceding edition of this diſpenſatory, has ſince been confirmed by Vauquelin, as well as the concluſion drawn from them, that it conſiſts principally of tannin, and cannot with propriety be claſſed among the gum-reſins. But the undoubted origin of the third kind, and the examination of a red aſtringent matter picked from a cavity in the Caſſurina, or beef-wood, prove that I was wrong in believing that kino was always obtained from aſtringent barks by decoction and evaporation. Kino is much more ſoluble in boiling, than in cold, water. The decoction therefore on cooling, becomes turbid with a very copious red ſediment. The reſiduum ſeems to be ſoftened by the heat of boiling water, at leaſt it agglutinates into maſſes reſembling melted red ſealing wax dropt into water. By repeated decoctions with very large quantities of water, I have never been able to exhauſt it of its ſoluble parts: the laſt decoctions had ſtill a deep red colour, and blackened ſolutions of iron. It is not more ſoluble in alcohol, and is not fuſible, but when thrown on live coals burns away without flame. Vauquelin obſerved that when the whole quantity of water neceſſary to diſſolve the ſoluble parts of kino is not employed at once, the reſiduum becomes more inſoluble. Alcohol diſſolves the whole of the Botany-bay kino except its impurities. With a certain proportion of water it lets fall a copious red precipitate, which may be ſeparated by filtration, but with a larger proportion of water its tranſparency is only ſlightly diſturbed. The ſolutions of kino precipitate gelatine; and, according to Vauquelin, ſilver, lead, and antimony, white; and, iron, green. I find that it reſembles other aſtringents, in forming a black precipitate with red ſulphate of iron, which, however, is converted into green by the ſlighteſt exceſs of the ſulphate, and by a larger exceſs is diſſolved into a bright green liquid.

Medical uſe.—It is a powerful remedy in obſtinate chronic diarrhœas and dyſenteries; in all paſſive hæmorrhagies, eſpecially from the uterus; in fluor albus; and in diſeaſes ariſing from laxity of the ſolids.

It is exhibited internally, in doſes of from ten to thirty grains, in ſubſtance, or diſſolved in diluted alcohol.

Externally, it is applied as a ſtyptic, to check hæmorrhagies from wounds or ulcers, and to diminiſh the diſcharge of ſanious or ichorous matter from ill-conditioned ulcers.

Off. prep.—Tinct. *Ed. Dub.* Elect. Catechu. *Ed. Dub.*

LACTUCA VIROSA. *Folia.* (*Ed.*)

Strong-ſcented or wild lettuce. The leaves.

Syngeneſia æqualis.—Nat. ord. *Compoſitæ ſemifloſculoſæ.*

THIS plant is biennial, and grows wild on rubbiſh and rough banks, in many places in this country.

It ſmells ſtrongly of opium, and reſembles it in ſome of its effects; and its narcotic power, like that of the poppy heads, reſides in its milky juice.

The garden lettuce when in flower is alſo very bitter, and abounds with a milky juice, in its taſte and ſmell remarkably like opium, for which when dried it has been propoſed and uſed with ſucceſs as a ſubſtitute. Before it begins to ſhoot, it has none of that bitterneſs, and contains no milky juice, and probably has not thoſe ſoporific effects which are commonly aſcribed to the uſe of lettuce.

Medical uſe.—An extract, prepared from the expreſſed juice of the leaves of the plant, gathered when in flower, is recommended in ſmall doſes in dropſy. In dropſies of long ſtanding, proceeding from viſceral obſtructions, it has been given to the extent of half an ounce a-day. It is ſaid to agree with the ſtomach, to quench thirſt, to be gently laxative, powerfully diuretic, and ſomewhat diaphoretic. Plentiful dilution is allowed during its operation. Dr. Collin of Vienna aſſerts, that out of twenty-four dropſical patients, all but one were cured by this medicine.

Off. prep.—Succus ſpiſſat, *Ed.*

LAURUS.

Willd. g. 798. *Enneandria Monogynia.*—Nat. ord. *Oleraceæ.*

Sp. 1. LAURUS CINNAMOMUM. *Cortex.* (*Ed.*) *Cinnamomum. Cortex et ejus oleum eſſentiale.* (*Lond. Dub.*)

The cinnamon tree. The bark and its eſſential oil.

THIS valuable tree is a native of Ceylon, where it was guarded with unremitting jealouſy by the Dutch, that they might monopolize the commerce of its productions. They failed, however, in the attempt; and cinnamon trees are found, not only in other parts of the Eaſt-Indies, but alſo in Jamaica, and other iſlands of the Weſt-Indies. Ceylon now belongs to the Britiſh, and Captain Percival has publiſhed a very intereſting account of the cinnamon tree. It is found in greateſt perfection in the immediate neighbourhood of Columbo, and grows from four to ten feet high, very buſhy. The leaves reſemble thoſe of the laurel, and have the hot taſte and ſmell of cloves when chewed. The bloſſom is white and very abundant, but diffuſes no odour. The fruit reſembles an acorn, and a ſpecies of fixed oil is obtained from it. There are ſeveral different ſpecies of cinnamon trees, or trees reſembling them, in Ceylon, but four only are barked by Government; the honey cinnamon, the ſnake cinnamon, the camphor cinnamon, which is inferior to theſe, and yields camphor from its roots, and mixed with gum from inciſions made into it, and the *cabatte* cinnamon which is harſher and more aſtringent than the others. The bark is collected at two ſeaſons, the grand harveſt laſts from April to Auguſt, the little harveſt is in December. Such branches as are three years old are lopped off, the epidermis is then ſcraped off, the bark ſlit up, looſened and removed entire ſo as to form a tube open at one ſide. The ſmaller of theſe are inſerted within the larger, and they are ſpread out to dry. They are then packed up in bundles. The taſting of theſe bundles to aſcertain their quality is a very diſagreeable duty impoſed on the ſurgeons, as it excoriates the tongue and mouth, and cauſes ſuch intolerable pain as renders it impoſſible for them to continue the preparations two or three days ſucceſſively. In their turns, however, they are obliged to reſume it, and they attempt to mitigate the pain by occaſionally eating a piece of bread and butter. It is then made up into large bundles about four feet long, and eighty pounds in weight. In ſtowing the bales on ſhip-board, the interſtices are filled up with black pepper, which is ſuppoſed to improve both ſpices.

The beſt cinnamon is rather pliable, and ought not much to exceed ſtout writing paper in thickneſs. It is of a light yellowiſh colour; it poſſeſſes a ſweet taſte, not ſo hot as to occaſion pain, and not ſucceeded by any after taſte. The inferior kind is diſtinguiſhed by being thicker, of a darker and browniſh colour, hot, and pungent when chewed, and ſucceeded by a diſagreeable bitter after taſte. The Dutch were accuſed of deteriorating their cinnamon by mixing it with a proportion of real cinnamon, but which had been deprived of its eſſential oil by diſtillation. This fraud could only be detected by the weaker ſmell and taſte. It is alſo often mixed with caſſia bark. This laſt is eaſily diſtinguiſhable by its breaking over ſmooth, and by its ſlimy mucilaginous taſte, without any thing of the roughneſs of the true cinnamon.

By diſtillation with water, it furniſhes a ſmall quantity of very pungent and fragrant oil, the water itſelf remains long milky, and has a ſtrong flavour of cinnamon. The watery extract in Neumann's experiment amounted to 720 from 7680 parts. With alcohol the oil does not ariſe in diſtillation, but remains in the extract, which amounts to 960.

The eſſential oil of cinnamon has a whitiſh yellow colour, a pungent burning taſte, and the peculiar fine flavour of cinnamon in a very great degree. It ſhould ſink in water, and be entirely ſoluble in alcohol. It is principally prepared in Ceylon.

Medical uſe.—Cinnamon is a very elegant and uſeful aromatic, more grateful both to the palate and ſtomach than moſt other ſubſtances of this claſs. Like other aromatics, the effects of cinnamon are ſtimulating, heating, ſtomachic, carminative, and tonic; but it is rather uſed as an adjunct to other remedies, than as a remedy itſelf.

The oil is one of the moſt powerful ſtimulants we poſſeſs, and is ſometimes uſed as a cordial in cramps of the ſtomach and in ſyncope; or as a ſtimulant in paralyſis of the tongue, or to deaden the nerve in toothach. But it is principally uſed as an aromatic, to cover the leſs agreeable taſte of other drugs.

Off. prep.—Aq. deſt, *Ed. Lond. Dub.* Spiritus, *Ed. Lond. Dub.* Tinct. *Ed. Lond. Dub.* Tinct. card. comp. *Lond. Dub.* Spt. lav. comp. *Lond. Ed. Dub.* Tinct. catechu, *Ed. Lond.* Acid. ſulph. arom. *Ed.* Emp. lad. comp. *Lond.*

Sp. 2. LAURUS CASSIA. *Cortex. Flores nondum expliciti.* (*Ed.*) *Caſſia Lignea. Cortex.* (*Dub.*)

The caſſia tree. The bark and flower-buds gathered before they open.

THIS tree is very ſimilar to the former. The bark, which is imported from different parts of the Eaſt-Indies and from China, has a very exact reſemblance to the cinnamon. It is diſtinguiſhable from the cinnamon, by being of a thicker and coarſer appearance, and by its breaking ſhort and ſmooth, while the cinnamon breaks fibrous and ſhivery.

It reſembles cinnamon ſtill more exactly in its aromatic flavour and pungency than in its external appearance, and ſeems only to differ from it in being conſiderably weaker, and in abounding more with a mucilaginous matter.

Caſſia buds are the flower-buds which are gathered and dried before they expand. They have the appearance of a nail, conſiſting of a round head, about the ſize of a pepper-corn, ſurrounded with the imperfect hexangular corolla, which gradually terminates in a point. They have a brown colour, and the ſmell and taſte of cinnamon.

Medical uſe.—Both the bark and buds of caſſia poſſeſs the ſame properties with cinnamon, though in an inferior degree.

The bark is very frequently, and ſometimes unintentionally, ſubſtituted for the more expenſive cinnamon; and the products obtained from caſſia bark and buds by diſtillation, are in no reſpect inferior to thoſe prepared from cinnamon.

Off. prep.—Aq. deſt. *Ed.* Pulv. arom. *Ed. Lond. Dub.* Pulv. carb. calcis, *Ed. Lond.* Elect. arom. *Dub.* Conf. arom. *Lond.* Elect. catechu, *Lond. Dub.* Troch. cretæ, *Lond.*

Sp. 3. LAURUS CAMPHORA. *Camphora.* (*Ed.*) *Camphora.* (*Lond.*) *Reſina.* (*Dub.*)

Camphor tree. Camphor.

THE camphor laurel grows in great abundance, and to a very conſiderable ſize, in the foreſts of Japan. It is not uncommon in green houſes in England. Every part of the tree ſmells ſtrongly of camphor, which is obtained from the trunk, branches, and root, by diſtillation. They are cut down into ſmall pieces, and put into a ſtill with a quantity of water. After the water has been kept boiling forty-eight hours, the camphor is found adhering to the ſtraw with which the head of the ſtill is lined. In this ſtate it is imported by the Dutch, and is called crude camphor. It is very impure, conſiſting of ſmall browniſh or dirty-grey grains, mixed with ſtraw, wood, hair, and other impurities. From theſe it is purified in Holland, by a ſecond ſublimation in glaſs veſſels; being previouſly mixed with quicklime, to combine with and prevent any empyreumatic oil with which it may be contaminated from ſubliming, while the camphor concretes in the upper part of the veſſel into cakes, convex on the one ſide, and concave on the other, about two or three inches thick, thinner at the edges, and generally perforated in the middle.

Pure camphor is lighter than water, very white, pellucid, ſomewhat unctuous to the touch, brittle, yet tough and elaſtic, ſo as to be ſcarcely pulverizable; ſhining in its fracture, and cryſtalline in its texture; of a bitteriſh, aromatic, pungent, taſte, yet accompanied with a ſenſe of coolneſs; of a ſtrong and very penetrating ſmell; very volatile, inflammable, burning entirely away without leaving any coal or aſhes; capable of combining with the fixed and volatile oils, reſins, and balſams; ſoluble in alcohol, ether, and the concentrated ſulphuric, nitric, and acetic acids; ſeparable from theſe alcoholic and acid ſolutions by water; inſoluble in water, alkalies, and the weaker acids; decompoſable by heat when mixed with alumina, being converted into an eſſential oil and charcoal, and by treating it with nitric acid, which acidifies it, producing camphoric acid.

But the production of camphor is not confined to the laurus camphora, although it furniſhes almoſt all the camphor of commerce; it is found in very great purity in interſtices among the woody fibres of an unknown tree in Borneo; it is alſo contained in the roots of the laurus cinnamomum and caſſia, Alpinia galanga, amomum zedoaria, &c.; in the ſeeds of the amomum cardamomum, piper cubeba, &c.; and in many indigenous plants, as in the thymus ſerpyllum and vulgaris, juniperus communis, roſmarinus officinalis, ſalvia officinalis, mentha piperita, &c. and may be ſeparated from the eſſential oils of roſemary, lavender, marjoram, and ſage. It is therefore now univerſally conſidered as a peculiar principle of vegetables, and not as a reſin, as ſtated by the Dublin college.

Medical uſe.—Camphor is a very active ſubſtance when taken into the ſtomach. It increaſes the heat of the body conſiderably, and gives a tendency to diaphoreſis, but without quickening the pulſe. At firſt it raiſes the ſpirits, but produces a ſubſequent depreſſion; and it facilitates voluntary motion. In exceſſive doſes it cauſes ſyncope, anxiety, retchings, convulſions, and delirium. Theſe violent effects of camphor are moſt effectually counteracted by opium.

In a morbid ſtate of the body, camphor allays inordinate actions. When the pulſe is hard and contracted, it renders it fuller and ſofter. It removes ſpaſms, and flitting pains ariſing from ſpaſms; and in delirium, when opium fails of procuring ſleep, camphor will often ſucceed. It is alſo ſaid to correct the bad effects of opium, mezereon, cantharides, and the draſtic purgatives and diuretics.

The moſt general indication for the uſe of camphor, is the languor or oppreſſion of the *vis vitæ*. It may therefore be given with advantage,

1. In all febrile diſeaſes of the typhoid type, eſpecially when attended with delirium.
2. In inflammations with typhoid fever, as in ſome caſes of peripneumonia and rheumatiſm.
3. In eruptive diſeaſes, to favour the eruption, or to bring it back to the ſkin, if from any cauſe it has ſuddenly receded, as in ſmallpox, meaſles, &c.
4. In many ſpaſmodic diſeaſes, eſpecially mania, melancholy, epilepſy, hyſteria, chorea, hiccough, &c.
5. In indolent local inflammations, not depending upon an internal cauſe, to excite action in the part.

As from its great lightneſs it is apt to ſwim upon the contents of the ſtomach, and to occaſion pain at its upper orifice, it is neceſſary that it be always exhibited in a ſtate of minute diviſion. In order to reduce it to powder, it muſt be previouſly moiſtened with a little alcohol. It may then be given,

1. In powder, with ſugar, magneſia, and nitrate of potaſs.
2. In pills, with the fetid gums and mucilage.
3. In ſolution, in alcohol, oil, or acetic acid.

4. Suſpended in the form of an emulſion, by means of mucilage, ſugar, yolk of egg, almonds, vinegar, &c.

Internally, it may be given in ſmall doſes, of from one to five grains, repeated at ſhort intervals, as its effects are very tranſient, or in large doſes, not under twenty grains.

Off. prep.—Ol. camph. *Ed.* Emulſio, *Ed. Lond.* Tinct. *Ed. Lond. Dub.* Acid. acet. camph. *Ed.* Tinct. opii camph. *Lond. Dub.* Tinct. ſap. *Ed.* Tinct. ſap. cum opio, *Ed.* Linim ſap. *Lond. Dub.* Linim camph. comp. *Lond. Dub.* Cerat. lith. acet. comp. *Lond. Dub.*

Sp. 10. LAURUS NOBILIS. *Folia. Baccæ. Baccarum oleum fixum.* (*Ed.*) *Laurus. Folium. Bacca.* (*Lond.*)

Bay tree. The leaves, berries, and expreſſed oil of the berries.

THIS tree is a native of the ſouth of Europe, but bears the winters of this climate perfectly well. Both leaves and berries contain a conſiderable quantity of eſſential oil, which renders them aromatic ſtimulating ſubſtances.

The berries are generally brought from the Mediterranean, and are more pungent than the leaves. In Spain and Italy a conſiderable quantity of oil is obtained by expreſſion from the freſh berries. It has a green colour, and ſtrong aromatic taſte and ſmell. As it therefore is not a fixed oil, but a mixture of fixed and eſſential oil, and as its peculiar properties depend entirely on the preſence of the latter, it is incorrectly ſtated to be a fixed oil by the Edinburgh college. It ſhould rather have been denominated, from the mode of its preparation, an expreſſed oil.

Medical uſe.—It is only uſed externally as a ſtimulant.

Off. prep.—Decoct. pro foment. *Lond.* Cataplaſ. cumini, *Lond.* Emp. cumini. *Lond.*

Sp. 34. LAURUS SASSAFRAS. *Lignum, radix, ejuſque cortex.* (*Ed.*) *Saſſafras. Lignum, radix ejuſque cortex.* (*Lond.*) *Lignum, radix eorumque cortex.* (*Dub.*)

Saſſafras. The wood, root, and bark.

THIS tree is a native of North America, and is cultivated in Jamaica. It is the root which is commonly employed. It is brought to us in long branched pieces. It is ſoft, light, and of a ſpongy texture; of a ruſty white colour; of a ſtrong pleaſant ſmell, reſembling that of fennel; and a ſweetiſh, aromatic, ſubacrid taſte. The bark is rough, of a brown aſh colour on the outſide, and ferruginous colour within; ſpongy and diviſible into layers, and of a ſtronger taſte and ſmell than the wood.

Neumann got from 480 grains 80 of alcoholic, and afterwards

60 of watery extract, and inverſely 120 watery and 7.5 alcoholic. In diſtillation the alcohol elevates nothing, but water a ponderous eſſential oil, in the proportion of about 10 from 480.

Medical uſe.—Saſſafras, from the quantity of volatile oil it contains, is a gently ſtimulating, heating, ſudorific, and diuretic remedy.

It is beſt given in infuſion. The decoction and extract are mere bitters, as the oil is diſſipated by the preparation.

The eſſential oil may be obtained ſeparate by diſtillation. It is of a whitiſh, yellow colour, and ſinks in water. It is highly ſtimulating and heating, and muſt be given only in very ſmall doſes.

Off. prep.—Ol. volat. *Ed. Lond.* Decoct. guaiaci comp. *Ed.* Decoct. ſarſ. comp. *Lond. Dub.*

LAVANDULA SPICA. *Spicæ florentes.* (*Ed.*) *Lavendula. Flos.* (*Lond.*) *Lavendula. Flores.* (*Dub.*)

Lavender. The flowering ſpikes.

Willd. g. 1099. *ſp.* 1. *Didynamia Gymnoſpermia.*—Nat. ord. *Verticillatæ.*

Lavender is a well known ſmall, ſhrubby, perennial plant, a native of the ſouth of Europe, but frequently cultivated in our gardens for the ſake of its perfume. There are two varieties. The flowers of both have a fragrant, agreeable ſmell, and a warm, pungent, bitteriſh taſte; the broad-leaved ſort is the ſtrongeſt in both reſpects, and yields in diſtillation thrice as much eſſential oil as the other; its oil is alſo hotter and ſpecifically heavier: hence, in the ſouthern parts of France, where both kinds grow wild, this only is uſed for the diſtillation of what is called Oil of Spike. The narrow-leaved is the ſort commonly met with in our gardens.

Medical uſe.—Lavender is a warm ſtimulating aromatic. It is principally uſed as a perfume.

Off. prep.—Ol. volat. *Ed. Lond.* Spiritus, *Ed. Lond. Dub.* Pulv. aſari comp. *Ed. Lond. Dub.*

LEONTODON TARAXACUM. *Herba. Radix.* (*Ed.*) *Taraxacum. Radix. Herba.* (*Lond.*) *Radix. Folia.* (*Dub.*)

Dandelion. The root and leaves.

Syngeneſia Æqualis.—Nat. ord. *Compoſitæ ſemifloſculoſæ.*

This perennial plant is very common in graſs fields and uncultivated places. The whole plant contains a bitter milky juice, which, however, is moſt abundant in the roots before the flower-ſtem ſhoots. The bitterneſs is deſtroyed by drying, and, therefore, the recent roots only ſhould be uſed.

Medical uſe.—Its vulgar name Piſs-a-bed, ſhews a popular belief of its poſſeſſing diuretic properties; and it was lately a very faſhionable remedy in Germany, and given in the form of an expreſſed juice or decoction, or extract prepared from either of them; but it ſeems to be merely a mucilaginous bitter.

LILIUM CANDIDUM. *Lilium album. Radix.* (*Dub.*)
The white lily. The root.
Willd. g. 127. *ſp.* 3. *Hexandria Monogynia.*—Nat. ord. *Liliaceæ.*

The white lily is a perennial, bulbous-rooted plant, a native of the ſouth of Europe, and cultivated in our gardens for the beauty of its flowers. The mucilaginous root is ſometimes uſed as a poultice; but it poſſeſſes no advantage over the poultices formed of any vegetable farina.

LINUM.
Willd. g. 590. *Pentandria Pentagynia.*—Nat. ord. *Gruinales.*

Sp. 1. Linum Usitatissimum. *Semen, ejuſque oleum fixum.* (*Ed.*) *Linum. Semen.* (*Lond. Dub.*)
Common flax. The ſeed, and oil expreſſed from the ſeed. Linſeed, and linſeed oil.

This valuable annual plant, is ſaid to have come originally from thoſe parts of Egypt which are expoſed to the inundations of the Nile. It now grows wild among our fields, in the ſouth of England, and many other parts of Europe, and is cultivated in large quantities.

Linſeed contains about one fifth of mucilage, and one ſixth of fixed oil. The mucilage reſides entirely in the ſkin, and is ſeparated by infuſion or decoction. The oil is ſeparated by expreſſion. It is one of the cheapeſt fixed oils; but is generally rancid and nauſeous, and unfit for internal uſe. The cake which remains after the expreſſion of the oil, contains the farinaceous and mucilaginous part of the ſeed, and is uſed in fattening cattle, under the name of Oil-cake.

Linſeed is conſidered as emollient, and demulcent. The entire ſeeds are only uſed in cataplaſms. The infuſion is uſed as a pectoral drink, and in ardor urinæ, nephritic pains, and during the exhibition of corroſive ſublimate.

Off. prep.—Oleum fixum, *Ed. Lond. Dub.* Oleum lini cum calce, *Ed.*

Sp. 26. Linum Catharticum. *Herba.* (*Dub.*)
Purging flax.

This is an annual plant, found wild on dry meadows and paſtures in Britain. Its virtue is expreſſed in its title: an infuſion in water or whey of a handful of the freſh herb, or a dram of them in ſubſtance when dried, are ſaid to purge without inconvenience.

LOBELIA SYPHILITICA. *Radix.* (*Ed.*)

Lobelia. The root.

Syngeneſia Monogamia.—Nat. ord. *Campanaceæ.*

THIS plant grows in moiſt places in Virginia, and bears our winters. It is perennial, has an erect ſtalk three or four feet high, blue flowers, a milky juice, and a rank ſmell. The root conſiſts of white fibres about two inches long, reſembles tobacco in taſte, which remains on the tongue, and is apt to excite vomiting.

Dr. Barton ſays, that it is conſiderably diuretic, and Mr. Pearſon found, that it generally diſagreed with the ſtomach, and ſeldom failed of affecting the bowels as a ſtrong cathartic. It certainly poſſeſſes no power of curing ſyphilis; even the Indians, when they have the diſeaſe, are glad of an opportunity of applying to the whites.

MALVA SYLVESTRIS. *Herba. Flores.* (*Ed.*) *Malva. Folium. Flos.* (*Lond.*)

Common mallow. The leaves and flowers.

Willd. g. 1290. *ſp.* 43. *Monadelphia Polyandria.*—Nat. ord. *Columniferæ.*

THIS is an annual plant, common in Britain, under hedges, near footpaths, and among rubbiſh.

The whole plant abounds with mucilage. The leaves were formerly of ſome eſteem, in food, for looſening the belly; at preſent, decoctions of them are ſometimes employed in dyſenteries, heat, and ſharpneſs of urine, and in general for obtunding acrimonious humours; their principal uſe is in emollient glyſters, cataplaſms, and fomentations.

Off. prep.—Deçoct. pro enemat. *Lond.*

MARRUBIUM VULGARE. *Herba.* (*Ed. Lond.*) *Folia.* (*Dub.*)

White horehound. The leaves.

Willd. g. 1111. *ſp.* 8. *Didynamia Gymnoſpermia.*—Nat. ord. *Verticillatæ.*

THIS is a perennial plant, which grows wild on road ſides, and among rubbiſh. The leaves have a very ſtrong, not diſagreeable ſmell, and a roughiſh, very bitter taſte. Neumann got from 480 grains, 270 watery, and 30 alcoholic extract, and inverſely 150 alcoholic, and 140 watery. They promote the fluid ſecretions in general, and, liberally taken, looſen the belly.

MEL. (*Lond. Dub. Ed.*)
Honey.

This is a well-known ſubſtance, and although it is moſt probably of vegetable origin, we do not procure it in any quantity except as an animal excretion, from the bee, (apis mellifica). This induſtrious inſect, in the ſummer time flies from flower to flower to collect the ſweet juice ſecreted in them. When ſufficiently loaded, it returns to its hive, where it depoſits it, as a winter's ſupply, in the cells of the comb it had prepared of wax to receive it. What change it undergoes in the body of the inſect is unknown; but it is certain, that honey varies very much, according to the nature of the plants from which it is collected. In ſome ſituations, where poiſonous plants abound, it is even deleterious.

The beſt honey is that which is freeſt from colour, and contains the largeſt grains when it concretes. For medical uſe, it ſhould alſo be as free of flavour as poſſible. That obtained from young bees, and which flows ſpontaneouſly from the combs, is the pureſt and fineſt, and is known by the name of Virgin honey. When ſeparated from the wax by expreſſion, it is leſs pure; and there is another ſort ſtill inferior, obtained by heating the combs before they are put into the preſs.

Honey conſiſts principally of ſugar, but it alſo probably contains mucilage and an acid, and is often impregnated with the eſſential oil of the flowers from which the bees have gathered it, as in the perfumed honey of the Crimea. In ſome parts of Aſia and America, poiſonous honey is met with, from the bees feeding on poiſonous flowers. Neumann exſiccated honey in the water bath: the vapour which aroſe, he ſays, took fire on the approach of a candle, and diffuſed its ſmell widely, and the liquor which was condenſed was manifeſtly impregnated, both with the ſmell and taſte of honey, and amounted to three ounces upon eight of honey.

Medical uſe.—From the earlieſt ages it has been employed as a medicine. Beſides the general properties of ſaccharine bodies, it poſſeſſes others peculiar to itſelf, probably depending on the preſence of an acid. For internal uſe, ſugar is always to be preferred, as honey in ſome conſtitutions produces gripes and colic pains. From its ſtimulus, however, it forms an excellent gargle, and facilitates the expectoration of viſcid phlegm, and is ſometimes employed as an emollient application to abſceſſes, and as a detergent to ulcers.

Off. prep.—Mel deſpum. *Ed. Lond. Dub.* Mel acet. *Lond. Dub.* Oxymel colchici, *Lond.* Mel roſæ, *Lond. Dub.* Mel ſcillæ, *Lond. Dub.* Oxymel ſcillæ, *Lond.* Oxymel æruginis, *Lond.*

MELALEUCA LEUCADENDRON. *Oleum volatile.* (*Ed.*)
Cajeputa officinarum.

The cajeput tree. The eſſential oil.

Polyadelphia Polyandria.—Nat. ord. *Heſperideæ.*

The tree which furniſhes the cajeput oil is frequent on the mountains of Amboyna, and other Molucca iſlands. It is obtained by diſtillation from the dried leaves of the ſmaller of two varieties. It is prepared in great quantities, eſpecially in the iſland of Banda, and ſent to Holland in copper flaſks. As it comes to us it is of a green colour, very limpid, lighter than water, of a ſtrong ſmell, reſembling camphor, and a ſtrong, pungent taſte, like that of cardamons. It burns entirely away, without leaving any reſiduum. It is often adulterated with other eſſential oils, coloured with the reſin of milfoil. In the genuine oil, the green colour depends on the preſence of copper; for when rectified it is colourleſs.

Medical uſe.—Like other aromatic oils it is highly ſtimulating, and is principally recommended in hyſteria, epilepſy, flatulent colic, and paralyſis of the tongue. The doſe is from one to four drops on a lump of ſugar.

It is applied externally where a warm and peculiar ſtimulus is requiſite; and is employed for reſtoring vigour after luxations and ſprains, and for eaſing violent pain in gouty and rheumatic caſes, in toothach, and ſimilar affections.

MELISSA OFFICINALIS. *Folia.* (*Ed.*) *Meliſſa. Herba.* (*Lond.*)

Balm. The leaves.

Willd. g. 1118. *ſp.* 1. *Didynamia Gymnoſpermia.*—Nat. ord. *Verticillatæ.*

Balm is a perennial plant, which grows wild on the Alps and Pyrennees, and is frequently cultivated in our gardens. It has a pleaſant ſmell, ſomewhat of the lemon kind; and a weak, roughiſh, aromatic taſte. The young ſhoots have the ſtrongeſt flavour; the flowers, and the herb itſelf when old, or produced in very moiſt rich ſoils or rainy ſeaſons, are much weaker both in ſmell and taſte.

It is principally uſed in the form of a watery infuſion, which is drunk in the manner of tea.

MELOË VESICATORIUS. (*Ed.*) *Cantharis.* (*Lond.*) *Cantharides.* (*Dub.*) *Lytta veſicatoria*, Fabricii.

Spaniſh fly. Bliſtering fly.

Inſecta, Coleoptera, Veſicantia.

These inſects have a longiſh, green, and gold-ſhining body, with flexible green-ſtriped elytra, which cover the whole back of the body, and under which are their brown membranous wings. On their head they have two black articulated feelers. They are found on the fraxinus, ſambucus, ſalix, liguſtrum, &c. in Spain, Italy, France, and Germany. The largeſt come from Italy, but the Spaniſh cantharides are preferred. They are gathered by ſhaking the trees on which they are found, and catching them on a cloth ſpread beneath it. They are then killed by the fumes of vinegar, and dried carefully in a ſtove. The melolontha vitis is ſometimes found mixed in conſiderable numbers with the cantharides. They are eaſily diſtinguiſhed by their almoſt ſquare body, and as probably they do not ſtimulate the ſkin, they ſhould be picked out before the cantharides are powdered.

The analyſis of cantharides, notwithſtanding the experiments of Thouvenel and Beaupoil, is ſtill extremely imperfect. Lewis aſcertained that their active conſtituent is entirely ſoluble both in water and in alcohol, for extracts made with each of theſe ſolvents bliſtered as far as could be judged equally, and as effectually as cantharides in ſubſtance. Both the reſidua were inactive. Neumann got from 1920 grains, 920 watery, and afterwards 28 alcoholic extract, and inverſely 400 alcoholic, and 192 watery.

Med. uſe.—Cantharides have a peculiar nauſeous ſmell, and an extremely acrid, burning taſte. Taken internally, they often occaſion a diſcharge of blood by urine, with exquiſite pain: if the doſe be conſiderable, they ſeem to inflame and exulcerate the whole inteſtinal canal; the ſtools become mucous and purulent; the breath fetid and cadaverous; intenſe pains are felt in the lower belly: the patient faints, grows giddy, delirious, and dies. Applied to the ſkin, they firſt inflame, and afterwards excoriate the part, raiſing a more perfect bliſter than any of the vegetable acrids, and occaſioning a more plentiful diſcharge of ſerum. But even the external application of cantharides is often followed by a ſtranguary, accompanied with thirſt and feveriſh heat.

The inconveniences ariſing from the uſe of cantharides, whether taken internally, or applied externally, are beſt obviated by drinking plentifully of bland emollient liquids, ſuch as milk, emulſions, &c. The ſpecific property of counteracting cantharides aſcribed to camphor, has no foundation.

The internal uſe of cantharides is at all times doubtful, and requires the moſt prudent management. They have, however, been ſometimes employed with ſucceſs in dropſy, and in diſeaſes of the urinary organs, ariſing from debility. They are given in ſubſtance in very ſmall doſes, or in tincture.

Applied externally, they are one of our beſt and moſt powerful remedies. By proper management, they may be regulated ſo as to act as a gentle ſtimulus, as a rubefacient, or as a bliſter.

Bliſters are applied,

1. To increaſe the activity of the ſyſtem in general, by means of their irritation.

2. To increaſe the activity of a particular organ.
3. To diminiſh morbid action in particular organs, by means of the irritation they excite in the parts to which they are applied.

They may be employed with advantage in almoſt all diſeaſes accompanied with typhus fever, eſpecially if any important viſcus as the brains, lungs, or liver, be at the ſame time particularly affected. In theſe caſes the bliſters are not applied to the diſeaſed organs themſelves, but as near them as may be convenient. When we wiſh to excite action in any organ, the bliſters are, if poſſible, applied directly to the diſeaſed organ.

Cantharides are employed externally, either in ſubſtance, mixed up with wax and reſin, ſo as to form a plaſter or ointment, or in the form of tincture.

Off. prep.—Tinct. *Ed. Lond. Dub.* Ungt. infuſi, *Ed. Lond. Dub.* Ungt. pulv. *Ed.* Cerat. *Lond. Dub.* Emp. *Ed. Lond. Dub.* Emp. comp. *Ed.*

MENTHA.

Willd. g. 1102. *Didynamia Gymnoſpermia.*—Nat. ord. *Verticillatæ.*

Sp. 7. MENTHA VIRIDIS. *Mentha ſativa. Herba.* (*Lond. Dub.*)
Spearmint. The plant.

SPEARMINT is perennial, and a native of Britain. The leaves have a warm, roughiſh, ſomewhat bitteriſh taſte; and a ſtrong, not unpleaſant, aromatic ſmell. Their virtues are ſtomachic and carminative.

Off. prep.—Aq. deſt. *Lond. Dub.* Oleum volat. *Lond. Dub.* Spiritus, *Lond.*

Sp. 13. MENTHA PIPERITA. *Herba.* (*Ed.*) *Mentha piperitis. Herba.* (*Lond. Dub.*)
Peppermint. The plant.

THIS ſpecies of mint is alſo perennial, and a native of Britain, where it is cultivated in very great quantities for the ſake of its eſſential oil. The leaves have a ſtrong, rather agreeable ſmell, and an intenſely pungent, aromatic taſte, reſembling that of pepper, and accompanied with a peculiar ſenſation of coldneſs.

Its predominant conſtituents are eſſential oil and camphor, both of which riſe in diſtillation, and are combined in what is called Oil of Peppermint.

Med. uſe.—Peppermint is principally uſed as a carminative and antiſpaſmodic. The diſtilled water is a domeſtic remedy for flatulent colic, and the eſſential oil is often given with advantage in doſes of a few drops in cramps of the ſtomach.

Off. prep.—Aq. deſt. *Ed. Lond. Dub.* Ol. volat. *Ed. Lond. Dub.* Spirit. *Ed. Lond.*

Sp. 20. MENTHA PULEGIUM. *Herba.* (*Ed.*) *Pulegium. Herba. Flos.* (*Lond.*) *Herba.* (*Dub.*)

Penny-royal. The herb and flower.

THIS is alſo perennial, and a native of Britain. In its ſenſible qualities, it is warm, pungent, and aromatic, ſomewhat ſimilar to ſpearmint, but leſs agreeable. It is ſeldom uſed.

Off. prep.—Aq. deſt. *Ed. Lond. Dub.* Ol. volat. *Lond. Dub.* Spirit. *Lond.*

MENYANTHES TRIFOLIATA. *Folia.* (*Ed.*) *Trifolium paludoſum. Herba.* (*Lond.*) *Folia.* (*Dub.*)

Marſh trefoil. The leaves.

Willd. g. 299. *ſp.* 4. *Pentandria Monogynia.*—Nat. ord. *Rotaceæ.*

THIS perennial plant is very common in marſhy ſituations, and is one of the moſt beautiful of our native flowers.

The leaves grow by threes on footſtalks. They are exceſſively bitter, and their bitterneſs is extracted by infuſion. They are ſaid to be ſometimes uſed in brewing ale, and that one ounce will go as far as half a pound of hops.

Medical uſe.—A drachm of them in powder purges and vomits. In infuſion or extract they have been recommended in intermittents, in ſeveral cachectic and cutaneous diſeaſes. The doſe of the extract is from ten to twenty grains.

MIMOSA.

Polygamia Monoecia.—Nat. ord. *Lomentaceæ.*

Sp. MIMOSA CATECHU. *Extractum ligni.* (*Ed.*) *Catechu. Succus ſpiſſatus.* (*Lond. Dub.*)

Cathechu. The extract of the wood.

THIS tree is a native of Hindoſtan. The extract of catechu, which was formerly termed, with peculiar impropriety, Japan earth, is principally prepared from the internal coloured part of the wood by decoction, evaporation, and exſiccation in the ſun. But catechu is alſo prepared in India from ſeveral other ſpecies of mimoſa, and even from the woods, barks, and fruits of other genera.

There are two kinds of this extract; one is ſent from Bombay, the other from Bengal. The extract from Bombay is of a uniform texture, and of a red brown tint, its ſpecific gravity being generally about 1.39. The extract from Bengal is more friable and leſs conſiſtent. Its colour is like that of chocolate externally; but when broken, its fracture preſent ſtreaks of chocolate and of red brown. Its ſpecific gravity is about 1.28. Their taſtes are preciſely ſimilar, being aſtringent, but leaving in the mouth a ſenſation of ſweetneſs. They do not deliqueſce or apparently change by expoſure to the air, and are not fuſible.

By Mr. Davy's analyſis, 200 grains gave

	BOMBAY.	BENGAL.
Tannin, - - -	109	97
Peculiar extractive matter, -	68	73
Mucilage, - - -	13	16
Reſidual matter, chiefly ſand and calcareous earth, - -	10	14

This more exact analyſis confirms the obſervations made by me in the preceeding edition of the diſpenſatory.

Medical uſe.—It may be uſefully employed for moſt purpoſes where an aſtringent is indicated; and it is particularly uſeful in alvine fluxes. Beſides this, it is employed alſo in uterine profluvia, in laxity and debility of the viſcera in general, in catarrhal affections, and various other diſeaſes where aſtringents are indicated. It is often ſuffered to diſſolve leiſurely in the mouth, as a topical aſtringent for laxities and exulcerations of the gums, for aphthous ulcers in the mouth, and ſimilar affections: and it is in ſome other caſes applied externally, both under the form of ſolution and of ointment.

Off. prep.—Infuſ. *Ed.* Elect. *Ed. Dub.* Tinct. *Ed. Lond.*

Sp. MIMOSA NILOTICA. *Gummi.* (*Ed.*) *Gummi Arabicum.* (*Lond. Dub.*)

Gum-Arabic.

THIS ſpecies of mimoſa grows in Arabia Petræa and Egypt. The greateſt quantity of pure gum, commonly called Gum-Arabic, is furniſhed by this tree, from which it exudes either ſpontaneouſly, or from inciſions made into the bark, and afterwards hardens in the air. But a ſimilar gum may be obtained from all the ſpecies of mimoſa, and from many other trees, ſuch as the Swietenia febrifuga, Melia azadirachta, and the different ſpecies of Terminalia. It is remarkable that the barks of all the trees which furniſh this bland mucilaginous ſubſtance, are highly aſtringent; that of the mimoſa nilotica itſelf is uſed in India for tanning; and in our own country, the cherry and plumb trees, which ſometimes yield a little gum, have very aſtringent barks.

There are two kinds of gum found in the ſhops, and ſold under the ſame name, Gum-Arabic which comes from the Levant, and

Eaſt-India gum. Gum-Arabic conſiſts of roundiſh tranſparent tears, of a yellowiſh colour, ſhining fracture, without ſmell or taſte, and perfectly ſoluble in water. The pieces which are moſt tranſparent and have leaſt colour are reckoned the beſt. They are ſelected from the Gum-Arabic in ſorts, and ſold for about double the price, under the title of picked gum. The Eaſt-India gum is darker coloured than Gum-Arabic, and is not ſo readily ſoluble in water. I poſſeſs a maſs of gum gathered from a mimoſa in New South Wales by Mr. Jamieſon, who is engaged in preparing for the preſs a moſt ſplendid and ſcientific deſcription of that country. It is darker coloured even than Eaſt-India gum, and is alſo leſs ſoluble than it: for when ſuſpended in water, it gives off white films which float through the mucilage. But its moſt remarkable property is, that it does not precipitate ſilicized potaſs, in which reſpect it agrees, as far as my experiments go, with gum collected in this neighbourhood from the common cherry and plumb trees. It is alſo remarkable that the coarſeſt gum forms the thickeſt mucilage; at leaſt Botany-bay gum forms a thicker mucilage than Eaſt-India gum, and this than Gum-Arabic.

Medical uſe.—It poſſeſſes the powers of a mucilaginous demulcent in a high degree; and is frequently exhibited in diarrhœa, dyſentery, chincough, hoarſeneſs, ſtrangury, &c.; and is an extremely uſeful article for giving form to ſome remedies, and for correcting the acrimony of others.

Off. prep.—Mucilago, *Ed. Lond. Dub.* Emulſio Arabica, *Dub.* Miſt. moſchata, *Lond.* Miſtura cretacea, *Lond. Dub.* Decoct. cornu cervi, *Lond.* Trochiſci carbonatis calcis, *Ed.* Trochiſci glycyrrh. *Ed.* Troch. gly. cum opio, *Ed.* Trochiſci gummos, *Ed. Dub.* Pulv. cretæ comp. *Lond.* Pulv. trag. comp. *Lond.*

MOMORDICA ELATERIUM. *Fructus recens ſubmaturus.* (*Ed.*) *Cucumis Agreſtis. Fructus recens.* (*Lond.*) *Fructus.* (*Dub.*)

Wild cucumber. The freſh fruit, when almoſt ripe,

Monoecia Syngeneſia.—Nat. ord. *Cucurbitaceæ.*

This plant is a native of the ſouth of Europe, and is perennial. When cultivated in this country, it does not ſurvive the winter. The fruit is oblong, about an inch and a half long, and an inch in diameter. It is of a green colour, and beſet with ſtiff hairs. When nearly ripe, it burſts on a ſlight touch, ſeparates from its ſtalk, and ſheds its ſeeds with great violence. From which circumſtance, it was named by the Greeks *Elaterium*, which name was alſo applied to the fæcula of the juice of the fruit, the only preparation uſed in medicine.

Medical uſe.—In a few grains it operates as a draſtic purgative, and is ſometimes uſed in dropſies.

Off. prep.—Succus ſpiſſat. *Ed. Lond.*

MORUS NIGRA. *Morus. Fructus.* (*Lond.*)
Mulberry tree. The fruit.
Monoecia Tetrandria.—Nat. ord. *Scabridæ.*

THIS tree, which is ſuppoſed to have come originally from Perſia, bears the cold of our winters, and ripens its fruit in England. The fruit has the ſame properties with other ſub-acid fruits. Its juice contains tartaric acid.

Off. prep.—Syr. ſuc. fruct. mori, *Lond.*

MOSCHUS MOSCHIFERUS. *Materia in folliculo prope umbilicum collecta.* (*Ed.*) *Moſchus.* (*Dub.*) *Materia in folliculo prope umbilicum ſito collecta.* (*Lond.*)
The muſk deer. Muſk. The ſubſtance contained in a follicle ſituated near the navel.
Mammalia.

THE muſk animal is an inhabitant of the moſt elevated region of Aſia, particularly of the Altayan Alps, and the mountains which divide Thibet from China. It is a gentle and timid animal, and its chace is difficult and dangerous. Its general form reſembles the deer tribe, and it is about three feet in length. In the male, behind the navel and before the prepuce, there is ſituated an oval bag, flat on one ſide and convex on the other, about three inches long and two broad, projecting about an inch, and having a ſmall open orifice, beſet with ſhort hairs, which is empty in the young animal, but in the adult is filled with a ſecreted matter, known by the name of muſk. When the bag becomes too full, the animal expreſſes part of its contents by rubbing itſelf againſt ſtones or trees. The muſk expreſſed in this manner is ſaid to be the pureſt, but none of it probably reaches this country. The beſt muſk is brought from Tonquin, an inferior ſort from Agria and Bengal, and a ſtill worſe from Ruſſia.

Fine muſk comes to us in round thin bladders; which are generally about the ſize of a pigeon's egg, covered with ſhort brown hairs, lined with a thin brown membrane, well filled, and without any appearance of having been opened. The muſk itſelf is dry, with a kind of unctuoſity, of a dark reddiſh brown, or ruſty blackiſh colour, in ſmall round grains, with very few hard black clots, and perfectly free from ſandy or other viſible foreign matter. If chewed, and rubbed with a knife on paper, it looks ſmooth, bright, yellowiſh, and is free from grittineſs. Laid on a red-hot iron, it catches flame, and burns almoſt entirely away, leaving only an exceeding ſmall quantity of light greyiſh aſhes. The largeſt and fulleſt bag ſcarcely contains more than two drachms of muſk.

Its taſte is ſomewhat bitteriſh, and its ſmell extremely powerful and peculiar. Neumann got from 30 grains of muſk 12 of watery and 4 of alcoholic extract; and inverſely, 10 of alcoholic and 6 of watery. Its ſmell and taſte were elevated in diſtillation with water, but not with alcohol. Neither the fixed nor volatile oils diſſolved it.

The very great price of muſk has given riſe to many modes of adulterating it. To increaſe its weight, ſand, and even particles of lead are introduced through very ſmall openings into the bags. The real muſk is frequently abſtracted from the bag, and its place ſupplied with dry and coarſely powdered blood, or ſome mixture with aſphaltum. Theſe adulterations are to be detected by diſcovering that the bag has been opened. The preſence of blood is alſo known by the fetid ſmell it emits when heated ſufficiently, and by the formation of ammonia when rubbed with potaſs. Aſphaltum is known by its ſhining fracture and melting on hot iron, while muſk is converted into charcoal. But there are even artificial bags filled with a compoſition containing ſome real muſk. Theſe are in general thicker, and covered with longer hair, and want the internal brown membrane which lines the real muſk-bag.

Medical uſe.—Muſk is a medicine of very great efficacy, and for which, in ſome caſes, there is hardly any ſubſtitute. When properly adminiſtered, it ſometimes ſucceeds in the moſt deſperate circumſtances. It raiſes the pulſe, without heating much; it allays ſpaſms, and operates remarkably on the brain, increaſing the powers of thought, ſenſation, and voluntary motion.

It may be employed in every inſtance of typhous fever, eſpecially when attended with delirium, or ſpaſmodic affection of any particular organ, or of the whole ſyſtem, or ſubſultus tendinum, &c. It is alſo uſed with the greateſt benefit in exanthematous and phlegmonic diſeaſes, accompanied with typhoid fever; and in many ſpaſmodic affections, as chincough, epilepſy, triſmus, &c.

It is moſt conveniently given in ſubſtance in powder, in doſes of three grains or upwards, repeated every one or two hours. Its beſt preparation is the tincture.

Off. prep.—Tinctura, *Dub.* Miſt. moſch. *Lond.*

MURIAS.

Muriate is the generic term for thoſe ſecondary compounds which contain muriatic acid. Their general properties have been already mentioned.

The muriates may be divided into three families:

1. Alkaline muriates,—ſoluble in water, fuſible, and vaporizable without decompoſition, forming no precipitate with alkaline carbonates.

2. Earthy muriates,—ſoluble in water n general, decompoſable by heat, forming a white precipitate with alkaline carbonates.

3. Metalline muriates.—The muriatic acid is capable of combining with many metals, in two ſtates of oxidizement. The muriates which contain the metal in the ſtate of protoxide, are in general very acrid, and ſoluble both in water and alcohol. The muriates which contain the metal in the ſtate of peroxide are often inſoluble, have a white colour, and contain an exceſs of baſe, or are ſub-muriates. The muriates are alſo the moſt volatile metalline ſalts, and often riſe undecompoſed in ſublimation or diſtillation.

MURIAS AMMONIÆ. (*Ed.*) *Sal ammoniacus.* (*Lond. Dub.*)

Muriate of ammonia is found native, eſpecially in the neighbourhood of volcanoes. It was firſt prepared in Egypt from the ſoot of camel-dung by ſublimation. But the greateſt part of that now uſed is manufactured in Europe, either by combining directly ammonia with muriatic acid, or by decompoſing the ſulphate of ammonia by means of muriate of ſoda, or the muriates of lime and magneſia by means of ammonia.

In commerce, muriate of ammonia occurs either ſublimed in firm, round, elaſtic, concavo-convex cakes, or cryſtallized in conical maſſes. The latter commonly contain other ſalts, eſpecially muriate of lime, which renders them deliqueſcent; and therefore the ſublimed muriate of ammonia is to be preferred for the purpoſes of medicine.

Muriate of ammonia has an acrid, pungent, urinous, taſte. It is ſoluble in about three times its weight of water at 60°, and in an equal weight at 212°. During its ſolution, it produces 32 degrees of cold. It is alſo ſoluble in about 4.5 parts of alcohol. It is permanent in the ordinary ſtate of the atmoſphere. By a gentle heat, it may be deprived of its water of cryſtallization, and reduced to the form of a white powder. At a higher temperature it ſublimes unchanged. Its cryſtals are either ſix-ſided pyramids, aggregated in a plumoſe form, or ſtill more commonly four-ſided pyramids. It conſiſts of 42.75 muriatic acid, 25.00 ammonia, and 32.25 water. It is decompoſed by the ſulphuric and nitric acids, by baryta, potaſs, ſoda, ſtrontia, and lime; by ſeveral ſecondary ſalts, containing theſe acids or baſes; and by thoſe metalline ſalts whoſe baſes form with muriatic acid an inſoluble compound.

Medical uſe.—Muriate of ammonia is now ſeldom uſed internally. It was formerly ſuppoſed to be a powerful aperient and attenuant of viſcid humours.

Externally applied, it is a valuable remedy. It may act in two ways,

1. By the cold produced during its ſolution.

It is from this cauſe that fomentations of muriate of ammonia probably prove beneficial in mania, apoplexy from plethora, eſions of the head, and in violent headachs. When uſed with this intention, the ſolution ſhould be applied as ſoon as it is made.

2. By the ſtimulus of the ſalt.

On this principle we may explain its action as a diſcutient in indolent tumours of all kinds, contuſions, gangrene, pſora, ophthalmia, cynanche, and in ſtimulating clyſters. In ſome caſes, as in chilblains and other indolent inflammations, both modes of action may be ſerviceable. When firſt applied, the coldneſs of the ſolution will diminiſh the ſenſe of heat and uneaſineſs of the part, and the ſubſequent ſtimulus will excite a more healthy action in the veſſels.

Off. prep.—Aqua ammon. *Ed. Lond. Dub.* Alcohol ammon. *Ed. Lond. Dub.* Carbonas ammon. *Ed. Lond. Dub.* Aqua carb. ammon. *Ed. Lond. Dub.* Liquor cupri ammoniat. *Lond. Dub.* Murias ammoniæ et ferri, *Ed. Lond.* Calx hyd. alba, *Lond.* Spiritus am. fœtid. *Lond.*

MURIAS SODÆ. (*Ed.*) *Sal Muriaticus.* (*Lond.*) *Sal Communis.* (*Dub.*)

Muriate of ſoda. Common ſea-ſalt.

THIS is the moſt common of all the neutral ſalts. It is not only found in immenſe maſſes on, and under, the earth's ſurface, and contained in great quantities in many ſalt ſprings, but it is the cauſe of the ſaltneſs of the ſea.

Native muriate of ſoda preſents two varieties, the lamellar and fibrous. It is found in Poland, Hungary, Spain, England, &c. When not perfectly pure, it is purified by ſolution and cryſtallization.

Salt ſprings occur in many parts of the world. The quantity of muriate of ſoda contained in theſe varies, from an inconſiderable quantity, even up to one third.

Sea-water alſo varies much in ſtrength. It is ſaid to contain moſt ſalt in warm climates, and at great depths.

Muriate of ſoda, as obtained from theſe natural ſolutions of it by evaporation and cryſtallization, is ſeldom pure, but commonly mixed with earthy muriates, which being deliqueſcent ſalts, diſpoſe it to attract moiſture from the atmoſphere. It may, however, be purified by precipitating the earths by means of carbonate of ſoda, or by waſhing the cryſtallized ſalt with a ſaturated ſolution of muriate of ſoda, heated to ebullition. In this ſtate it is not capable of diſſolving any more muriate of ſoda, but will diſſolve a conſiderable quantity of the earthy muriates.

Muriate of ſoda has a pure ſalt taſte, is ſoluble in 2.8 times its weight of water at 60°, and in 2.76 at 212°. It is not ſoluble in alcohol. By the action of heat it firſt decrepitates, then melts, and laſtly, ſublimes without decompoſition. The primitive form of its cryſtals is cubic, and they are permanent in the atmoſphere. According to Kirwan, they conſiſt of 38.88 muriatic acid, 53. ſoda, and 8.12 water. It is decompoſed by the ſulphuric and nitric acids, by potaſs and baryta, by ſecondary ſalts containing theſe, and by metalline ſalts, whoſe baſe forms an inſoluble compound with muriatic acid. It is alſo gradually decompoſed by lime, iron, and litharge.

Med. uſe.—Muriate of ſoda is one of the moſt important articles in the arts, and in domeſtic economy. As a medicine, it is uſeful in ſome caſes of dyſpepſia; and in large doſes it is ſaid to check vomiting of blood. It is a common ingredient in ſtimulating clyſters, and is ſometimes applied externally as a fomentation to bruiſes, or in the form of bath, as a gentle ſtimulus to the whole ſurface of the body.

Off. prep.—Murias ſodæ exſiccat. *Ed. Dub.* Acid muriat. *Ed. Lond. Dub.* Murias antim. *Ed. Lond. Dub.* Sub-murias hydrarg. præcip. *Ed. Lond. Dub.*

MYRISTICA MOSCHATA. *Fructûs nucleus*, Nux Moſchata *dictus*. *Macis*. *Hujus oleum fixum*, Oleum Macis *dictum*. *Oleum volatile*. (*Ed.*) *Myriſtica*. *Fructûs nucleus*, Nux Moſchata *dictus*. *Oleum eſſentiale*. *Oleum expreſſum*, Oleum Macis *vulgo dictum*. *Macis*. (*Lond.*) *Nux Moſchata*. *Oleum eſſentiale*. *Oleum expreſſum*. *Involucrum*, Macis *dictum*. (*Dub.*)

The nutmeg tree. The kernel of the fruit, commonly called Nutmeg. Its eſſential oil. Its expreſſed oil, called Oil of Mace. The involucrum of the nut (mace).

Monoecia Monandria.—Nat. ord. *Oleraceæ.*

The tree which furniſhes this elegant ſpice is a native of the Molucca iſlands. It is not, however, cultivated in any of them except Banda, from which all Europe has been hitherto ſupplied with mace and nutmeg. The entire fruit is about the ſize of a peach, and is marked with a longitudinal furrow. The external covering is ſmooth, fleſhy, and bitter. As the fruit ripens, this burſts and diſcloſes the mace, which is an oily membranous pulp, of a dark-red colour and aromatic flavour, divided into narrow branched ſlips. Within the mace is incloſed the nut, which conſiſts of a brown, thin, hard ſhell, and a fat perenchymatous kernel, of an oval ſhape. The fruit is gathered three times a-year. The external covering is ſeparated on the ſpot, and the mace and nut carried home, where they are carefully dried in the ſun. After they are dried, the nutmegs are dipt in lime water, and the mace is ſprinkled with ſalt water, probably to preſerve them from the attacks of inſects.

Mace by drying acquires a reddiſh-yellow colour. When good, it is flexible, thin, oily, of a deep colour, ſtrong agreeable ſmell, and an aromatic, bitteriſh, acrid taſte. When brittle, divided into fewer ſlips of a whitiſh or pale yellow colour, and of little ſmell or taſte, it is to be rejected.

Neumann got from 7680 parts of mace 2160 alcoholic, and 1200 watery extract; and inverſely, 1920 watery, and 1440 alcoholic extract, with 300 of volatile oil heavier than water, which aroſe during the inſpiſſation of the watery extract. The expreſſed oil of mace is leſs conſiſtent than that of nutmegs.

Nutmegs are oval, flattened at both ends, of a grey-brown colour, and reticularly furrowed on the outſide, of a yellow colour within, variegated with brown undulating lines, ſolid, hard, unctuous to the feel, and eaſily cut with a knife; and have a balſamic ſmell, and agreeable aromatic taſte. The ſmall round nutmegs are better than the large oval ones; and they ſhould have a ſtrong ſmell and taſte, and ſhould neither be worm-eaten, muſty, nor variegated with black lines. Their activity is, however, confined to the dark coloured veins which are not apt to be worm-eaten.

Neumann got from 1920 parts of nutmeg, 480 of an oily alcoholic extract, and 280 watery, with 320 fixed oil: theſe two laſt were both inſipid: and inverſely 600 watery extract, with 50 of fixed oil, which roſe to the ſurface during the inſpiſſation, and 10 of volatile oil which diſtilled over; and afterwards, 120 unctuous alcoholic extract, and 300 more of fixed oil. By expreſſion 1920 gave 540 of oil, and afterwards 480 of watery extract, a pretty ſtrongly taſted diſtilled water, and 80 unctuous alcoholic extract, with 60 of inſipid fixed oil.

Off. prep.—Spirit. nucis moſchat, *Ed. Lond. Dub.* Spirit. lav. comp. *Ed. Lond. Dub.* Pulv. carb. calcis comp. *Ed.* Confectio aromat. *Dub. Lond.* Elect. catechu, *Ed. Dub.* Trochiſci carb. calcis, *Ed.*

Volatile oil of nutmeg. By diſtillation they yield a conſiderable quantity of eſſential oil, of a whitiſh yellow colour, lighter than water, and poſſeſſing the aromatic taſte and ſmell in an eminent degree. In doſes of a few drops it is a powerful carminative and ſtomachic.

Off. prep.—Spirit. alk. volat. aromat.

Expreſſed oil of mace. Nutmegs alſo yield by expreſſion a conſiderable quantity of limpid yellow oil, which on cooling concretes into a ſebaceous conſiſtence. They are previouſly beaten to a ſoft paſte in a warm mortar, then incloſed in a linen bag, expoſed to the vapour of hot water, and ſqueezed in a preſs, of which the plates have been heated.

It is a mixture of the volatile oil, on which their flavour depends, and of a fixed oil, of a white colour, without taſte or ſmell; and as the properties which characteriſe it depend on the preſence of the volatile oil, the denomination of Fixed Oil, applied to it by the

Edinburgh college, is leſs correct than that of Expreſſed Oil, given to it by the other colleges, from the manner of its preparation.

In the ſhops we meet with three ſorts of unctuous ſubſtances called Oil of Mace, though really expreſſed from the nutmeg. The beſt is brought from the Eaſt Indies in ſtone jars; this is of a thick conſiſtence, of the colour of mace, and an agreeable fragrant ſmell: the ſecond ſort, which is paler coloured, and much inferior in quality, comes from Holland in ſolid maſſes, generally flat and of a ſquare figure: the third, which is the worſt of all, and uſually called Common Oil of Mace, is an artificial compoſition of ſuet, palm oil, and the like, flavoured with a little genuine oil of nutmeg. 7680 of the ſecond ſort yielded to Neumann 330 volatile oil heavier than water, 2880 of fluid expreſſible oil, and 4560 of ſolid but fuſible ſebaceous matter, perfectly inſipid, inodorous, and of a chalky whiteneſs.

Off. prep.—Emp. lad. comp. *Lond.*

Medical uſe.—Both mace and nutmegs are rather to be conſidered as aromatic ſpices than as articles of medicine. From the eſſential oil they contain they are heating and ſtimulating, and they are added to other medicines for the ſake of their agreeable flavour.

MYROXYLON PERUIFERUM. *Balſamum.* (*Ed.*) *Balſamum Peruvianum.* (*Lond. Dub.*)

Sweet-ſmelling balſam tree. Peruvian balſum.

Willd. g. 829. *ſp.* 1. *Decandria Monogynia.*—Nat. ord. *Lomentaceæ.*

THIS tree grows in the warmeſt provinces of South America, and is remarkable for its elegant appearance. Every part of it abounds with reſinous juice, even the leaves are full of tranſparent reſinous points like thoſe of the orange tree.

The balſam as brought to us, is commonly of the conſiſtence of thin honey, of a reddiſh brown colour, inclining to black, an agreeable aromatic ſmell, and a very hot biting taſte.

It is very often adulterated, and ſometimes what is ſold for Peruvian balſam, is a ſpurious mixture of reſin and eſſential oil, flavoured with benzoin. Theſe frauds are not eaſily detected, and fortunately they are of little importance.

It is ſaid to be obtained by boiling the cuttings of the twigs in water, and ſkimming off with a ſpoon the balſam which ſwims on the top.

By inciſion this tree yields a much more fragrant white or colourleſs balſam, which, when inſpiſſated by the heat of the ſun, forms the red or dry balſam of Peru; but they are very rarely in uſe in Britain, and almoſt never to be met with in our ſhops.

Peruvian balſam conſiſts of a volatile oil, reſin, and benzoic acid. It is accordingly entirely ſoluble in alcohol, and in eſſential oils.

Water diſſolves part of the benzoic acid, and fixed oil combines with the reſin. It may be ſuſpended in water by trituration with mucilage and yolk of eggs.

Med. uſe.—Balſam of Peru is a very warm aromatic medicine, conſiderably hotter and more acrid than Copaiva. Its principal effects are, to warm the habit, and to ſtrengthen the nervous ſyſtem. Hence its uſe in ſome kinds of aſthmas, gonorrhœas, dyſenteries, ſuppreſſions of the uterine diſcharges, and other diſorders proceeding from a debility of the ſolids. It is alſo employed externally, for cleanſing and healing wounds and ulcers, and ſometimes againſt palſies and rheumatic pains.

Off. prep.—Tinctura, *Lond.* Troch. glyc. comp. *Dub.*

MYRRHA. *Gummi-reſina.* (*Ed. Lond. Dub.*)
Myrrh. A gum-reſin.

THE tree which produces this gum-reſin is not yet aſcertained. Mr. Bruce has given ſome reaſons for ſuppoſing that it is a mimoſa; but we may obſerve, that all the mimoſas with which we are ſufficiently acquainted furniſh a pure gum, and not a gum-reſin. The beſt myrrh is brought from Troglodytitia, a province of Abyſſinia, on the borders of the Red ſea; but what we receive comes from the Eaſt Indies, and is produced on the eaſtern coaſt of Arabia Felix.

The beſt myrrh is in the form of tears. It ſhould be of a yellow, or reddiſh-yellow colour, becoming redder when breathed on, light, brittle, of an unctuous feel, pellucid, ſhining; preſenting white ſemicircular ſtriæ in its fracture; of a very bitter aromatic taſte, and a ſtrong, peculiar, not unpleaſant odour. It is not good if whitiſh, dark-coloured, black, reſinous, ill-ſmelled, or mixed with impurities, which is too commonly the caſe.

Neumann aſcertained that water and alcohol are both of them capable of taking up the whole of the taſte and ſmell of the myrrh, the extract made by either after the other being inſipid. The alcohol diſtilled from the tincture elevated none of the flavour of the myrrh; but during the inſpiſſation of the decoction a volatile oil aroſe, containing the whole of the flavour of the myrrh, and heavier than water, while the extract was merely bitter. From 7680 parts of myrrh he got 6000 watery extract, 180 volatile oil, and 720 alcoholic; and inverſely, 2400 alcoholic, and 4200 watery. I have obſerved that the tincture is tranſparent, and when poured into water, forms a yellow opaque fluid, but lets fall no precipitate, while the watery ſolution is always yellow and opaque: and that myrrh is not fuſible and is difficultly inflammable. Mr. Hatchett found it ſoluble in alkalies.

Medical uſe.—Myrrh is a heating ſtimulating medicine. It frequently occaſions a mild diaphoreſis, and promotes the fluid ſecretions in general. Hence it proves ſerviceable in cachectic diſeaſes, ariſing from inactivity of the ſyſtem, and is ſuppoſed to act eſpecially upon the uterine ſyſtem, and to reſiſt putrefaction.

It is exhibited,

1. In ſubſtance; in the form of powder, or made up into pills, in doſes of ten to ſixty grains.
2. Diſſolved in water, as in Griffiths' famous but unchemical myrrh mixture.
3. Diſſolved in alcohol.

Off. prep.—Tinctura, *Ed. Lond. Dub.* Tinct. aloes æther, *Ed.* Tinctura aloes cum myrrha, *Ed. Lond.* Pulv. myrrhæ comp. *Lond.* Pulv. aloes cum ferro, *Lond.* Pil. galb. comp. *Lond.* Pil. rhœi comp. *Ed.* Pil. aloes cum myrrha, *Lond. Ed.* Pil. aſſæ fœt. comp. *Ed.*

MYRTUS PIMENTA. *Fructus.* (*Ed.*) *Pimento. Bacca.* (*Lond.*) *Semina.* (*Dub.*)

Pimento tree. The fruit, commonly called Jamaica pepper.

Willd. g. 973. ſp. 28. Icoſandria Monogynia.—Nat. ord. *Heſperideæ.*

This is a native of Jamaica, and grows in all the woodlands on the north ſide. Soon after the trees have bloſſomed, the berries become fit for gathering; the fruit not being ſuffered to ripen, as in that ſtate it is moiſt and glutinous, and therefore difficult to cure, and when dried becomes black and taſteleſs. The berries are dried by ſpreading them on a terrace, expoſed to the ſun, for about ſeven days, during which time they gradually loſe their green colour, and become of a reddiſh-brown.

The ſmell of this ſpice reſembles a mixture of cinnamon, cloves, and nutmegs: its taſte approaches to that of cloves, or a mixture of the three foregoing; whence it has received the name of *all-ſpice.*

Neumann aſcertained that its flavour reſides entirely in a volatile oil heavier than water, and its pungency in a reſin or a ſubſtance ſoluble in alcohol and inſoluble in water. From 480 parts he got 120 watery extract, 30 volatile oil, and 20 alcoholic extract; and inverſely, 66 alcoholic and 100 watery.

Med. uſe.—Pimento is a warm aromatic ſtimulant, and is much uſed as a condiment in dreſſing food. As a medicine, it is advantageouſly ſubſtituted for the more coſtly ſpices, eſpecially in hoſpital practice.

Off. prep.—Aq. deſtil. *Ed. Lond.* Ol. volat. *Ed.* Spirit. *Ed. Lond. Dub.* Syr. ſpin. cerv. *Lond.* Pil. opii, *Ed.*

NICOTIANA TABACUM. *Folia.* (*Ed.*) *Nicotiana. Folium.* (*Lond. Dub.*)

Tobacco. The leaves.

Willd. g. 379. *ſp.* 1. *Pentandria Monogynia.*—Nat. ord. *Solanaceæ.*

This is an annual plant, a native of America, from whence it was firſt brought into Europe, about the year 1560. It is now ſometimes cultivated for medicinal uſe in our gardens; but in general it is imported from America in large quantities. The leaves are about two feet long, of a pale green colour whilſt freſh, and when carefully dried of a lively yellowiſh caſt. They have a ſtrong, diſagreeable, narcotic ſmell, and a very acrid burning taſte.

The active conſtituent of tobacco is an eſſential oil; for, by long boiling, the decoction and extract of tobacco become almoſt inert; and by diſtillation an oil is obtained from it, ſo active, that ſmall animals are almoſt inſtantly killed, when wounded by a needle dipped in it.

Medical uſe.—On the living body, whether taken into the ſtomach in ſubſtance or ſolution, or into the lungs in the form of ſmoke, or applied to abraded ſurfaces, tobacco is capable of producing deleterious effects. It often proves virulently cathartic or emetic, and occaſions intolerable cardialgia, anxiety, and vertigo.

The ſyſtem becomes eaſily habituated to the action of tobacco; and many people uſe very large quantities of it in various ways as a luxury, without experiencing any other bad effect than what ariſes from their being unable to relinquiſh it after the habit is confirmed.

As a medicine it is exhibited in various forms:

1. In ſubſtance. When chewed, it cauſes an increaſed flow of ſaliva, and ſometimes relieves the toothach; and reduced to powder, it proves an excellent errhine and ſternutatory, when ſnuffed up the noſtrils.
2. In infuſion in water or wine. Taken in ſuch ſmall doſes as to have little effect on the ſtomach, it proves powerfully diuretic, and was employed by Dr. Fowler with very great ſucceſs in caſes of dropſy and dyſuria. It is alſo applied externally for the cure of pſora, tinea, and other cutaneous diſeaſes.
3. In the form of ſmoke, it is injected into the anus by means of bellows of a peculiar conſtruction. By acting as a ſtimulus to the rectum, it ſometimes ſucceeds in reviving the vital powers in ſome kinds of aſphyxia, and in evacuating the inteſtines in caſes of obſtinate conſtipation.

Off. prep.—Vin. nicot. tabac. *Ed.*

NITRAS.

Nitrate is the generic term for ſecondary compounds, which conſiſt of nitric acid, combined with any baſe. Their general characters have been already mentioned. There are three families of nitrates.

1. Alkaline nitrates;—ſoluble in water; ſolubility increaſed by increaſe of temperature; cryſtallizable; forming no precipitate with alkaline carbonates.

2. Earthy nitrates;—ſoluble in water; forming a white precipitate with alkaline carbonates.

3. Metallic nitrates;—generally ſoluble, both in water and in alcohol; decompoſable by heat, furniſhing nitric oxide gas, and leaving the metal oxidized to a maximum.

NITRAS POTASSÆ. (*Ed.*) *Nitrum.* (*Lond. Dub.*)

Nitrate of potaſs. Nitre.

Nitrate of potaſs is annually produced on the ſurface of the earth in many countries. For this production, the preſence of a calcareous baſe, heat, and an open, but not too free, communication with dry atmoſpheric air, are requiſite. The putrefaction of organic, eſpecially animal ſubſtances, is not neceſſary to, but accelerates the formation of, this ſalt, by affording the azote in a ſtate in which it combines readily with the oxygen of the atmoſphere, and forms the nitric acid. Accordingly, in Germany and France, nitrate of potaſs is prepared, by expoſing mixtures of putrefying animal and vegetable ſubſtances, and calcareous earths, to the action of the atmoſphere. The ſalt is afterwards extracted by lixiviation and cryſtallization. The nitre uſed in this country is chiefly imported from the Eaſt Indies. As it occurs in commerce, it often contains a little muriate of potaſs and muriate of ſoda, from which it is eaſily purified by diſſolving it in boiling water, and filtering it; on cooling, the nitrate of potaſs cryſtallizes, and the other ſalts remain diſſolved.

Nitrate of potaſs has a ſharp, bitteriſh, cooling taſte. It ſhoots in pretty large cryſtals, which are generally ſix-ſided priſms, terminated by ſix-ſided pyramids; very brittle, and permanent in the atmoſphere; ſoluble in ſeven times their weight of water at 60°, and in an equal weight at 212°; melting when expoſed to a ſtrong heat, giving out at firſt oxygen, and afterwards nitrogen gas, until the whole acid be decompoſed, and the potaſs alone remain behind. It deflagrates more or leſs violently with all oxygenizable ſubſtances, oxidizing or acidifying them. When dried in a temperature of 70°, it conſiſts, according to Kirwan, of 44 nitric acid, 51.8 potaſs, and 4.2 water. It is decompoſed by the ſulphuric acid and baryta, by the muriate and acetite of baryta, and the ſulphates of ſoda, ammonia, magneſia, and alumina.

Medical uſe.—Taken to the extent of from a drachm to half an ounce in the courſe of a day, in repeated doſes, it diminiſhes the heat of the body, and the frequency of the pulſe, and operates by ſtool, and acts upon the ſecretion of urine, but is apt to produce pains in the ſtomach. In large doſes, ſuch as an ounce, taken at one time, it produces the moſt dreadful ſymptoms, conſtant vomiting, purging, mixed with blood, convulſions and death. Accidents of this kind have happened from its being ſold by miſtake for ſulphate of ſoda.

It is beſt given in ſmall doſes, as five to ten grains frequently repeated, and is only admiſſible in inflammatory diſeaſes. Externally it is uſed in gargles, for inflammatory ſore throats.

Off. prep.—Acid. nitr. *Lond. Ed. Dub.* Nitr. purif. *Lond.* Sulphas pot. cum ſulph. *Ed.* Antim. calc. *Lond.* Oxid. ant. cum ſulph. per nitrat. pot. *Ed. Lond. Dub.* Trochiſci nitri, *Ed. Lond.*

OLEA EUROPÆA. *Fructûs oleum fixum.* (*Ed.*) *Oliva et ejus oleum.* (*Lond.*) *Oleum olivarum.* (*Dub.*)

The olive tree. The fruit and oil expreſſed from the fruit.

Willd. g. 36. *ſp.* 1. *Diandria Monogynia.*—Nat. ord. *Sepiariæ.*

THIS tree is a native of the ſouth of Europe and north of Africa. It is cultivated in France, Spain, and Italy, for the ſake of its fruit and the oil expreſſed from it. Olives, when freſh, have an acrid, bitter, extremely diſagreeable, taſte; but they are only eaten when pickled. They are firſt ſteeped for ſeveral days in a ley of wood-aſhes, and then pickled in a ſtrong ſolution of muriate of ſoda.

They are principally valued for the oil they afford by expreſſion. For this purpoſe they are gathered when fully ripe, and immediately bruiſed and ſubjected to the preſs. The fineſt oil flows firſt, and a very bad oil is obtained by boiling the magma, which remains after expreſſion, in water. According to Beaumé, they are gathered when ſufficiently ripe. They are then dried, to deprive the mucilage, of which they contain a large quantity, of its water, and are expreſſed after being bruiſed, and moiſtened with a little water to render the oil more fluid. By reſt, the mucilage and water which may have paſſed with it, ſeparate. It is ſometimes mixed with oil of poppy ſeeds; but, by expoſing the mixture to the freezing temperature, the olive oil freezes, while that of the poppies remains fluid; and as oils which freeze with moſt difficulty are moſt apt to become rancid, olive is deteriorated by the admixture of poppy oil.

Good olive oil ſhould have a pale yellow colour, ſomewhat inclining to green, a bland taſte, without any rancidity, and no ſmell, and ſhould congeal at 38° Fahrenheit. In this country it is frequently rancid, and ſometimes adulterated.

Medical uſe.—Taken internally, it operates as a gentle laxative, and is given in caſes of worms. It is alſo given in large quantities to mitigate the action of acrid ſubſtances taken into the ſtomach. It is uſed externally in frictions, in gargles, and in clyſters; but its principal employment is for the compoſition of ointments and plaſters.

Off. prep.—Oleum ammoniat. *Ed. Lond.* Oleum camph. *Ed.* Oleum ſulph. *Ed. Lond.* Linim. ſimp. *Ed.* Unguent. ſimp. *Ed.* Unguent. ſper. ceti, *Lond. Dub.* Unguentum ceræ, *Lond. Dub.* Cerat. ſimp. *Ed.* Cer. ſper. ceti, *Lond. Dub.* Unguent. reſin flavæ, *Lond. Dub.* Unguent. elemi, *Lond. Dub.* Unguent. ſambuci, *Lond. Dub.* Emplaſt. oxidi plumbi ſemivitrei, *Ed. Lond. Dub.* Ceratum ſaponis, *Lond. Dub.* Ung. ceruſſ. acet. *Lond. Dub.* U. lith. acetat. *Lond. Dub.* Emplaſt. hyd. *Ed.* Cerat. lap. cal. *Lond. Dub.* Emplaſt. oxidi ferri rubri, *Ed.*

ONISCUS ASELLUS. *Millepeda.* (*Lond.*) *Millepedæ, ſpiritûs vini vapore enecatæ.*

Slaters killed by the vapour of alcohol.

Inſecta aptera.

These inſects are found in cellars, under ſtones, and in cold moiſt places; in warm countries they are rarely met with. They have a faint diſagreeable ſmell, and a ſomewhat pungent, ſweetiſh, nauſeous taſte.

Neumann got from 480 parts 95 watery, and 10 alcoholic extract; and inverſely, 52 alcoholic, and 45 watery. Nothing roſe in diſtillation with either.

Their medical virtues have been very much over-rated.

Off. prep.—Millepedæ ppt. *Lond. Dub.*

ORIGANUM.

Willd. g. 1116. *Didynamia Gymnoſpermia.*—Nat. ord. *Verticillatæ.*

Sp. 10. Origanum Vulgare. *Origanum. Herba.* (*Lond.*) *Folia.* (*Dub.*)

Wild marjoram. The herb.

This is a perennial plant, and is met with upon dry chalky hills, and in gravelly ſoils, in ſeveral parts of Britain. It has an agreeable ſmell, and a pungent taſte, warmer than that of the garden marjorum, and much reſembling thyme, with which it ſeems to agree in virtue. An eſſential oil diſtilled from it is kept in the ſhops, and is very acrid.

Off. prep.—Ol. volat. *Lond. Dub.*

Sp. 15. Origanum Majorana. *Herba.* (*Ed.*) *Majorana. Herba.* (*Lond. Dub.*)

Sweet marjoram. The plant.

Sweet marjoram is an annual plant, which grows wild in Portugal, but is cultivated in our gardens, principally for culinary purpoſes. It is a moderately warm aromatic, yielding its virtues both to aqueous and ſpiritous liquors by infuſion, and to water in diſtillation.

Off. prep.—Pulv. aſari comp. *Ed. Lond. Dub.*

OSTREA EDULIS. *Oſtrea. Teſta.* (*Lond.*) *Putamina.* (*Dub.*)

Oyſter. The ſhell.

Cl. *Vermes.* Ord. *Teſtacea.*

The oyſter is a very nutritious article of diet, and in ſome diſeaſes not only admiſſible, but even advantageous. Their ſhells, which are officinal, are compoſed, like all the mother-of-pearl ſhells, of alternate layers of carbonate of lime, and a thin membranaceous ſubſtance, which exactly reſembles coagulated albumen in all its properties. By burning, the membrane is deſtroyed, and they are converted into lime, which, although very pure, poſſeſſes no advantage over that of the mineral kingdom.

Off. prep.—Oſt. teſt. ppt. *Lond. Dub.*

OVIS ARIES. *Adeps.* (*Ed.*) *Ovis Sevum.* (*Lond.*) *Sevum ovillum.* (*Dub.*)

The ſheep. Mutton-ſuet.

Cl. *Mammalia.* Ord. *Ruminantia.*

Mutton is a highly nutritious and wholeſome food. Ewe-milk is thick and heavy, and contains much cream and little whey. The cheeſe made from it has a bitter biting taſte, eſpecially when old, and is ſuppoſed to be ſtomachic. Mutton-ſuet is officinal, for the purpoſe of giving conſiſtency to ointments and plaſters.

Off. prep.—Sebum ppt. *Lond.* Emplaſt. ceræ, *Ed. Lond. Dub.* Ungt. elemi, *Lond. Dub.* Ungt. picis, *Lond. Dub.* Ungt. ſambuci, *Lond. Dub.* Emp. mel. veſic, *Ed.* Ungt. hydrarg. *Ed. Lond. Dub.*

OXALIS ACETOSELLA. *Lujula. Folium.* (*Lond.*) *Acetoſella. Folia.* (*Dub.*)

Wood-ſorrel. The leaves.

Willd. g. 918. *ſp.* 25. *Decandria Pentagynia.*—Nat. ord. *Gruinales.*

This is a ſmall perennial plant, which grows wild in woods, and ſhady hedges. The leaves contain a conſiderable quantity of ſuper-oxalate of potaſs, and have an extremely pleaſant acid taſte. They poſſeſs the ſame powers with the vegetable acids in general, and may be given in infuſion, or beaten with ſugar into a conſerve, or boiled with milk to form an acid whey. The ſuper-oxalate of potaſs is extracted in large quantities from them, and ſold under the name of *Eſſential Salt of Lemons*.

Twenty pounds of the freſh leaves yielded to Neumann ſix pounds of juice, from which he got two ounces two drachms and a ſcruple of ſalt, beſides two ounces and ſix drachms of an impure ſaline maſs.

Off. prep.—Conſerva, *Lond. Dub.*

PÆNEA SARCOCOLLA. *Sarcocolla Gummi-reſina.* (*Lond.*) Sarcocoll. A gum-reſin.

Willd. g. 218. *ſp.* 1. *Tetrandria Monogynia.*—Nat. ord. *Conglomeratæ.*

THE plant is a native of Ethiopia, and yields the ſarcocoll by ſpontaneous exudation. The tears of ſarcocoll are ſeldom ſo large as peas, and have either a pale red, or yellowiſh white colour. They are extremely brittle, or rather friable, ſhining in their fracture, reſembling a good deal gum-arabic in coarſe powder, but rather more opaque. They have no ſmell, but a bitter taſte, combined with a ſweetneſs like that of liquorice. Neumann obtained from 480 parts, 360 of alcoholic, and afterwards 40 of watery extract, and inverſely 450 watery, and 26 alcoholic. In diſtillation nothing aroſe. It is not fuſible, and kindles with difficulty. Dr. Thomſon conſiders ſarcocoll as a peculiar vegetable principle, which he defines to be ſoluble in water and in alcohol, taſte bitter ſweet, and uncryſtallizable. Manna, one of his ſpecies is, however, very cryſtallizable. Sarcocoll was ſuppoſed to poſſeſs peculiar virtues in agglutinating wounds.

Off. prep.—Pulv. ceruſſæ comp. *Lond.*

PANAX QUINQUEFOLIUM. *Ginſeng. Radix.* (*Lond.*) Ginſeng. The root.

Polygamia Diœcia.—Nat. ord. *Hederaceæ.*

THIS is a perennial plant, which grows in Tartary and North America. The root is about the thickneſs of the little finger; an inch or two in length, often dividing into two branches; of a whitiſh-yellow colour; wrinkled on the ſurface; of a compact, almoſt horny texture; when broken, exhibiting a reſinous circle in the middle, of a reddiſh colour. It has no ſmell, but a very ſweet taſte, combined with a ſlight degree of aromatic bitterneſs.

The Chineſe, probably on account of its ſcarcity, have a very extraordinary opinion of the virtues of this root, ſo that it ſells for many times its weight of ſilver. The Americans, on the contrary, diſregard it, becauſe it is found plentifully in their woods. In fact, it is a gentle and agreeable ſtimulant.

PAPAVER.

Willd. g. 1015.—*Polyandria Monogynia.*—Nat. ord. *Rhœades.*

Sp. 5. Papaver Rhoeas. *Papaver erraticum. Flos.* (*Lond.*) Common roſe, or red poppy. The flower.

This ſpecies of poppy is annual, and very common in our corn fields. The petals give out a fine red colour when infuſed, and are ſuppoſed to poſſeſs ſlightly anodyne properties.

Off. prep.—Syr. papav. erratici, *Lond.*

Sp. 7. Papaver Somniferum. *Capſula, et ſuccus ſpiſſatus.* (*Ed.*) *Papaver album. Capſula.* (*Lond. Dub.*) *Opium.* (*Lond. Dub.*)

White poppy. The capſules and their inſpiſſated juice, commonly called Opium.

The white poppy is alſo an annual, and is ſometimes found wild in this country, but it is probably originally a native of the warmer parts of Aſia.

In this country it is frequently cultivated for the beauty of the varieties of its flowers, and for its ſeeds. Some attempts have been made to obtain opium from its capſules; and Mr. Ball received a premium from the Society for encouraging the Arts, for ſpecimens of Britiſh opium, in no reſpect inferior to the beſt eaſtern opium. But we apprehend that the climate of this country is an inſuperable obſtacle to its becoming a profitable branch of agriculture.

The leaves, ſtalks, and capſules, of the poppy, abound with a milky juice, which may be collected in conſiderable quantity, by ſlightly wounding them when almoſt ripe: this juice, expoſed for a few days to the air, thickens into a ſtiff tenacious maſs, which in fact is opium. It is then worked up into maſſes, and covered with poppy or tobacco leaves. By decoction and expreſſion this juice is partially extracted, together with a conſiderable quantity of mucilage. The liquor ſtrongly preſſed out, ſuffered to ſettle, clarified with whites of eggs, and evaporated to a due conſiſtence, yields about one fifth, or one ſixth the weight of the heads, of extract. This poſſeſſes the virtues of opium in a very inferior degree; but it does not come to this country unleſs when uſed to adulterate the genuine opium. A ſtrong decoction of the dried heads, mixed with as much ſugar as is ſufficient to reduce it into the conſiſtence of a ſyrup, becomes fit for keeping in a liquid form; and is the only officinal preparation of the poppy. It is, however, a very unequal preparation, as the real quantity of opium it contains is very uncertain, and by no means equal to ſyrup, to which a certain quantity of ſolution of opium is added.

The ſeeds of the poppy are ſimply emulſive, and contain none of the narcotic principle. They yield a conſiderable quantity of fixed oil by expreſſion.

Two kinds of opium are found in commerce, diſtinguiſhed by the names of Turkiſh and Eaſt-India opium.

Turkey opium is a ſolid compact ſubſtance, poſſeſſing a conſiderable degree of tenacity; when broken, having a ſhining fracture and uniform appearance; of a dark brown colour; when moiſtened, marking on paper a light brown interrupted ſtreak, and becoming yellow when reduced to powder; ſcarcely colouring the ſaliva when chewed, exciting at firſt a nauſeous bitter taſte, which ſoon becomes acrid, with ſome degree of warmth; and having a peculiar heavy diſagreeable ſmell. The beſt is in flat pieces, and beſides the large leaves in which it is enveloped, is covered with the reddiſh capſules of a ſpecies of rumex, probably uſed in packing it. The round maſſes which have none of theſe capſules adhering to them, are evidently inferior in quality. It is bad if it be ſoft, friable, mixed with any impurities, have an intenſely dark or blackiſh colour, a weak or empyreumatic ſmell, a ſweetiſh taſte, or draw upon paper a brown continuous ſtreak.

Eaſt-India opium has much leſs conſiſtence, being ſometimes not much thicker than tar, and always ductile. Its colour is much darker; its taſte more nauſeous, and leſs bitter; and, its ſmell rather empyreumatic. It is conſiderably cheaper than Turkiſh opium, and ſuppoſed of only half the ſtrength. One eighth of the weight of the cakes is allowed for the enormous quantity of leaves with which they are enveloped. In the Eaſt-Indies, when opium is not good enough to bring a certain price, it is deſtroyed under the inſpection of officers.

Opium is not fuſible, but is ſoftened even by the heat of the fingers. It is highly inflammable. It is partially ſoluble, both in alcohol and in water. Neumann got from 1920 parts of opium, 1520 alcoholic, and afterwards 80 watery extract, 320 remaining undiſſolved, and inverſely 1280 watery, and 200 alcoholic extract, the reſiduum being 440.

The ſolutions are tranſparent, and have a brown or vinous colour. The watery ſolution is not decompoſed by alcohol. A ſmall quantity of matter, which, as far as my experiments go, is neither fuſible nor remarkably inflammable, is ſeparated from the alcoholic ſolution by water. I have alſo obſerved that the watery ſolution of opium or the alcoholic, after it has been precipitated by water, does not redden vegetable blues, is not precipitated by acids or alkalies, but is precipitated copiouſly by carbonate of potaſs, muriate and ſuper-nitrate of mercury, oxymuriate of tin, ſulphate of copper, ſulphate of zinc, acetate of lead, nitrate of ſilver, and red ſulphate of iron. The precipitate in the laſt caſe was dirty brown, not reſembling thoſe by alkaline or aſtringent ſubſtances. The ſolutions of opium, eſpecially the watery, are alſo copiouſly precipitated by infuſion of galls. This precipitate ſeems to reſemble that produced by cinchonin, and to be different from that produced by gelatin.

Alcohol, or water diſtilled from opium, are impregnated with its narcotic virtues, which are alſo diminiſhed, or entirely diſſipated, by long boiling, roaſting, or great age. The part of opium which is inſoluble either in water or in alcohol, is albumen, according to Gren; caoutchouc, according to Buchholtz; a virulent glutinous ſubſtance, according to Joſſe; and Prouſt ſays it contains wax. From experiments made ſome years ago, I concluded that it was perfectly ſimilar to the gluten of wheat flour, or fibrine. Long ago it was propoſed by M——, to ſeparate the reſinous parts of opium by the ſame proceſs that the fibrine of wheat flour is obtained. The fact is, that if Turkey opium be kneaded in a large quantity of water, the ſoluble parts are removed, and there remains in the hand an adheſive plaſtic maſs, of a paler colour, not fuſible, but becoming ductile when immerſed in hot water, inflammable, imparting ſome colour to alcohol, but not ſoluble in it. Eaſt-India opium, treated in the ſame way, is entirely diſſolved or diffuſed in the water, and leaves no plaſtic maſs in the hand.

Upon the whole, it appears that the active conſtituent of opium, though not perfectly underſtood, is of a volatile nature, but ſomewhat fixed by its combination with the other conſtituents; that it is ſoluble both in water and in alcohol; that it is diſſipated in the proceſſes recommended for purifying opium by ſolution and evaporation; and that the attempts, made by ſome pharmaceutiſts, to obtain a preparation of opium, which ſhould poſſeſs only its ſedative, without its narcotic, effects, only ſucceeded in ſo far as they diminiſhed its activity.

By evaporating a watery ſolution of opium to the conſiſtence of a ſyrup, Derome obtained a precipitate, which was increaſed by diluting it with water. He diſſolved this in hot alcohol, from which it again ſeparated on cooling. When purified by repeated ſolutions it cryſtallized in rectangular priſms, with rhomboidal baſes, had no taſte or ſmell, was inſoluble in cold water, and ſoluble in 400 parts of boiling water, did not affect vegetable blues, was ſoluble in 24 parts boiling, and 110 cold, alcohol; ſoluble in hot ether and volatile oils, and ſeparated from them as they cooled; very ſoluble in all acids, and highly narcotic. Theſe obſervations are curious, and deſerve to be confirmed.

Medical uſe.—The action of opium on the living ſyſtem, has been the ſubject of the keeneſt controverſy. Some have aſſerted that it is a direct ſedative, and that it produces no ſtimulant effects whatever, while others have aſſerted as ſtrongly, that it is a powerful, and highly diffuſible, ſtimulus, and that the ſedative effects, which it certainly produces, are merely the conſequence of the previous excitement. The truth appears to be that opium is certainly capable of producing a certain degree of excitement, while the ſedative effects which always ſucceed, are incomparably greater than could be produced by the preceding excitement. The ſtimulant effects are moſt apparent from ſmall doſes. Theſe increaſe the energy of the mind, the frequency of the pulſe, and the heat of the body, excite thirſt, render the mouth dry and parched, and diminiſh all the ſecretions and excretions, except the cuticular diſcharge, which they increaſe. Theſe effects are ſucceeded by languor and laſſitude. In larger doſes, the ſtimulant effects are not ſo apparent, but the power of all ſtimulating cauſes of making impreſſions on either the body or mind, is remarkably diminiſhed, pain and fear both ceaſing to make any impreſſion, and confuſion of head, vertigo, and ſleep, are produced. In exceſſive doſes it proves a violent narcotic poiſon, producing headach, vertigo, delirium, and convulſions, accompanied with a very ſlow pulſe, ſtertorous breathing, and a remarkable degree of inſenſibility or ſtupor, terminated by apoplectic death. In one caſe where I inſpected the body after death, the inner membrane of the ſtomach was remarkably corrugated, and with ſome inflammation, but as large doſes of ſulphate of zinc, and of flour of muſtard had been alſo taken, no inference can be drawn from theſe appearances. The bad effects of an over-doſe of opium are often prevented by vomiting when it is excited, and they are beſt counteracted by making the patient drink freely of acids and coffee, and not permitting him to yield to his deſire of ſleeping. By habit, the effects of opium on the body are remarkably diminiſhed. There have been inſtances of four grains proving fatal to adults, while others have been known to conſume as many drachms daily. The habitual uſe of opium produces the ſame effects with habitual dram drinking, tremors, paralyſis, and ſtupidity, and like it can ſcarcely ever be relinquiſhed.

From theſe effects of opium in a ſtate of health, it is not wonderful that recourſe ſhould have been had to it in diſeaſe, as mitigating pain, inducing ſleep, allaying inordinate action, and diminiſhing morbid ſenſibility. That theſe effects reſult from it, is confirmed by the daily experience of every obſerver; and as anſwering one or other of theſe intentions, moſt, if not all, of the good conſequences derived from it in actual practice are to be explained

If, therefore, by a ſedative medicine, we mean an article capable of allaying, aſſuaging, mitigating, and compoſing, no ſubſtance can have a better title to the appellation of ſedative than opium.

Some practitioners are averſe to its uſe in active inflammation; but others have recourſe to it in ſuch caſes, even at an early period, eſpecially after blood-letting; and where ſuch affections are attended not only with pain and ſpaſm, but with watchfulneſs and cough, it is often productive of the greateſt benefit. Opium combined with calomel has of late been extenſively employed in every form of active inflammation, and with the greateſt ſucceſs. It is found alſo to be of very great ſervice in allaying the pain and preventing the ſymptomatic fever liable to be induced by wounds, fractures, burns, or ſimilar accidents.

In intermittents, it is ſaid to have been uſed with good effect before the fit, in the cold ſtage, in the hot ſtage, and during the interval. Given even in the hot ſtage, it has been obſerved to allay the heat, thirſt, headach, and delirium, to induce ſweat and ſleep, to cure the diſeaſe with leſs bark, and without leaving abdominal obſtructions or dropſy.

It is often of very great ſervice in fevers of the typhoid type, when patients are diſtreſſed with watchfulneſs or diarrhœa. But where theſe or ſimilar circumſtances do not indicate its uſe, it is often diſtreſſing to patients by augmenting thirſt and conſtipation.

In ſmall-pox, when the convulſions before eruption are frequent and conſiderable, or when the accompanying fever is of the typhoid type, opium is liberally uſed. It is likewiſe given from the fifth day onwards; and is found to allay the pain of ſuppuration, to promote the pytaliſm, and to be otherwiſe uſeful.

In dyſentery, after the uſe of gentle laxatives, or along with them, opium, independently of any effect it may have on the fever, is of conſequence in allaying the tormina and teneſmus, and in obviating that laxity of bowels which ſo frequently remains after that diſeaſe.

In diarrhœa, the diſeaſe itſelf generally carries off any acrimony that may be a cauſe, and then opium is uſed with great effect. Even in the worſt ſymptomatic caſes, it ſeldom fails to alleviate.

In cholera and pyroſis, it is almoſt the only thing truſted to.

In colic, it is employed with laxatives; and often prevents ileus and inflammation, by relieving the ſpaſm. Even in ileus it is ſometimes uſed to allay the vomiting, the ſpaſms, and the pain.

It is given to allay the pain and favour the deſcent of calculi, and to give relief in jaundice and dyſuria proceeding from ſpaſm.

It is of acknowledged uſe in the different ſpecies of tetanus; affords relief to the various ſpaſmodic ſymptoms of dyſpepſia, hyſteria, hypochondriaſis, aſthma, rabies canina, &c. and has been found uſeful in ſome kinds of epilepſy.

In ſyphilis it is only uſeful in combating ſymptoms, and in counteracting the effects reſulting from the improper uſe of mercury, for it poſſeſſes no power of overcoming the venereal virus.

It is found uſeful in certain caſes of threatened abortion and lingering delivery, in convulſions during parturition, and in the after pains and exceſſive flooding.

The adminiſtration of opium to the unaccuſtomed, is ſometimes very difficult. The requiſite quantity of opium is wonderfully different in different perſons, and in different ſtates of the ſame perſon. A quarter of a grain will in one adult produce effects which ten times the quantity will not do in another; and a doſe that might prove fatal in cholera or colic, would not be perceptible in many caſes of tetanus or mania. When given in too ſmall a doſe, it is apt to produce diſturbed ſleep, and other diſagreeable conſequences; and with ſome conſtitutions it ſeems not to agree in any doſe or form. Often, on the other hand, from a ſmall doſe, ſound ſleep, and alleviation of pain will be produced, while a larger one gives riſe to vertigo and delirium. Its ſtimulant effects are moſt certainly produced by the repetition of ſmall doſes, its anodyne by the giving of a full doſe at once. In ſome it ſeems not to have its proper effect till after a conſiderable time. The operation of a moderate doſe is ſuppoſed to laſt in general about eight hours from the time of taking it.

Externally, opium is uſed to diminiſh pain, and to remove ſpaſmodic affections. It is found particularly ſerviceable in chronic ophthalmia, when accompanied with morbidly increaſed ſenſibility.

Opium may be exhibited,

1. In ſubſtances, made up in the form of a pill, troche, or electuary. Its moſt efficient form.
2. Diſſolved in diluted alcohol, or white wine.
3. Diſſolved in water or watery fluids. Very periſhable.
4. Dried and reduced to powder.

It is often given in combination with aromatics, aſtringents, emetics, bitters, camphor, ſoap, diſtilled waters, mucilage, ſyrups, acids, carbonate of ammonia, ether, acetate of lead, tartrate of antimony and potaſs, and unctuous ſubſtances. Some of theſe are certainly unchemical mixtures, for I find by experiment that the ſolutions of opium are copiouſly precipitated by aſtringents, the alkaline carbonates, and all the metallic ſalts.

Off. prep.—Pil. *Lond. Ed.* Opium purificat. *Lond. Dub.* Extract. opii, *Ed. Lond.* Troch. glycyrr. cum opio, *Ed. Lond.* Elect. ſive Confect. opiat. *Ed. Lond.* Elect. catechu, *Ed. Dub.* Tinctura opii, *Ed. Lond. Dub.* Tinct. opii camph. *Lond. Dub.* Tinct. op. ammoniat. *Ed.* Syr. opii, *Dub.* Syr. papav. ſomniferi, *Ed. Lond.* Pulv. opiat, *Ed.* Pulv. ipecac. et opii, *Ed.*

PARIETARIA OFFICINALIS. *Parietaria. Herba.* (*Lond.*)
Pellitory of the wall. The herb.
Polygamia Monœcia.—Nat. ord. *Scabridæ.*

THIS is a ſmall plant growing upon old walls; of an herbaceous ſub-ſaline taſte, without any ſmell.

PASTINACA OPOPONAX. *Opoponax. Gummi-reſina.* (*Lond.*)
Opoponax. A gum-reſin.
Willd. g. 558. *ſp.* 3. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

THIS plant is perennial, and grows wild in the ſouth of Europe; but the gum-reſin which is ſaid to be obtained by wounding the ſtalk or root, is brought from the Levant and Eaſt-Indies, ſometimes in round drops or tears, but more commonly in irregular lumps, of a reddiſh yellow colour on the outſide with ſpecks of white, inwardly of a paler colour, and frequently variegated with large white pieces. It has a peculiar ſtrong ſmell, and a bitter, acrid, ſomewhat nauſeous, taſte.

Neumann got from 480 parts, 166 alcoholic, and afterwards 180 watery extract, and inverſely 226 watery, and 60 alcoholic. Both the water and alcohol diſtilled from it were impregnated with its flavour. It forms a milky ſolution with water, and yields a little eſſential oil on diſtillation. It is ſuppoſed to be emenagogue, but is rarely uſed.

Off. prep.—Pil. galb. comp.

PHASIANUS GALLUS. *Ovum.* (*Lond.*) *Ovum; putamen.* (*Dub.*)
The dunghill-fowl. The egg, and egg-ſhell.
Cl. *Aves.* Ord. *Gallinæ.*

FROM what country this uſeful bird originally came, is not aſcertained. It is now domeſticated almoſt everywhere, and furniſhes one of the moſt wholeſome and delicate articles of food.

The egg only is officinal. The ſhell conſiſts principally of carbonate of lime, with a ſmall quantity of phoſphate of lime and animal matter. When burnt, the animal matter and carbonic acid are deſtroyed, and we obtain a lime, mixed with a little phoſphate of lime.

The contents of the egg conſiſts of two ſubſtances, the white, and the yolk. The white is albumen, combined with a little ſoda and ſulphur. The yolk is alſo albuminous, but contains alſo a bland-oil, and ſome colouring matter. The latter is ſometimes uſed in pharmacy for ſuſpending oily and reſinous ſubſtances in water. The former is uſed for clarification.

Off. prep.—Ovorum teſtæ ppt. *Dub.* Cataplaſm alumin. *Lond. Dub.*

PHYSETER MACROCEPHALUS. *Sevum.* (*Ed.*) *Spermaceti.* (*Lond.*) *Spermaceti.* (*Dub.*)

Spermaceti-whale. The ſuet. Spermaceti.

Cl. *Mammalia.* Ord. *Cetacea.*

The ſpermaceti whale is characterized by his enormous head, great part of which is occupied by a triangular cavity of bone, covered only by the common integuments. In the living animal this cavity is filled with a white, fluid, oily ſubſtance, amounting ſometimes to many tons in weight. On the death of the whale, it congeals into a white unctuous maſs, from which a conſiderable quantity of very pure whale oil is obtained by expreſſion. The reſiduum, afterwards freed from impurities, by waſhing with water, melting, ſtraining, expreſſion through linen bags, and, laſtly, waſhing in a weak ley of potaſs, is the peculiar ſubſtance well known by the name of Spermaceti. It is alſo contained in ſolution in the common whale and other fiſh-oils; for it is often found depoſited, by a ſpecies of cryſtallization, in the reſervoirs containing them.

The chemical properties of ſpermaceti have been already noticed. As a medicine, for internal uſe, it agrees with the fixed vegetable oils; and in the compoſition of ointments, &c. its place may be very well ſupplied by a mixture of oil and wax.

Off. prep.—Ungt. ſperm. ceti, *Lond. Dub.* Ungt. ceræ, *Lond. Dub.* Cerat ſimp. *Ed. Lond. Dub.*

PIMPINELLA ANISUM. *Semen.* (*Ed.*) *Aniſum. Semen.* (*Lond. Dub.*)

Aniſe. The ſeed.

Willd. g. 562. *ſp.* 8. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

Anise is an annual umbelliferous plant, growing naturally in Crete, Syria, and other places of the eaſt. It is cultivated in ſome parts of France, Germany, and Spain, and may be raiſed alſo in England: the ſeeds brought from Spain, which are ſmaller than the others, are preferred.

Aniſeeds have an aromatic ſmell, and a pleaſant warm taſte, accompanied with a degree of ſweetneſs. Water extracts very little of their flavour; rectified ſpirit the whole.

Off. prep. Ol. volat. *Ed. Lond. Dub.* Spirit. *Lond.*

PINUS.
Monœcia Adelphia.—Nat. ord. *Coniferæ.*

Sp. PINUS ABIES.
a. Reſina. (*Ed.*) *Pix Burgundica.* (*Dub.*)
b. Reſina alba. (*Dub.*)
Common ſpruce-fir. Burgundy-pitch. Common frankincenſe.

Sp. PINUS BALSAMEA. *Reſina.* (*Ed.*) *Balſamum Canadenſe.* (*Lond. Dub.*)
Hemlock-fir. Balſam of Canada.

Sp. PINUS LARIX.
a. Reſina. (*Ed.*) *Terebinethina veneta.* (*Dub.*)
b. Oleum volatile. (*Ed.*)
The larch. Venice turpentine. Oil of turpentine.

Sp. PINUS SYLVESTRIS.
a. Reſina. (*Ed.*) *Pix liquida.* (*Dub.*)
b. Terebinethina vulgaris. (*Dub.*)
c. Reſina alba. (*Dub.*)
Scotch fir. Tar. Common turpentine. Common frankincenſe.

THESE different ſpecies of fir are all natives of ſandy ſituations. The laſt only grows wild in this country. They all abound in every part with a reſinous juice, which poſſeſſes the ſame general qualities, but preſents ſome varieties, according to the nature of the ſpecies and mode of preparation.

We may arrange the products,

1. Into thoſe which exude ſpontaneouſly.
2. Into thoſe procured by wounding the tree.
3. Into thoſe procured by decoction. And
4. Into thoſe which are procured by the action of fire.

The pinus larix exudes a ſpecies of manna, called Briançon Manna, but which is not uſed; as, beſides the ſaccharine matters, it evidently contains turpentine.

From the pinus abies, and perhaps from the pinus ſylveſtris, in warm ſeaſons and climates, a reſinous juice exudes ſpontaneouſly, which hardens into tears. It is the *Thus* of the London Pharmacopœia, the *Reſina alba* of the Dublin? or common frankincenſe.

To obtain the products of the ſecond kind, a ſeries of wounds are made through the bark into the wood, beginning at the bottom, and riſing gradually upwards, until a ſtripe of the bark, about nine feet high, be removed, which is commonly effected in about four years. The ſame operation is then repeated on the oppoſite ſide. The operation is then recommenced cloſe to the edge of the former wound, which by this time is nearly cloſed. A tree worked in this manner will ſurvive and furniſh turpentine for near a century. The juice which flows from theſe wounds during ſummer, is collected in a ſmall cavity, formed in the earth at the bottom of the inciſions, from which it is occaſionally removed into proper reſervoirs previous to its purification. As the trees exude very little juice during cold weather, no new inciſions are made in winter; but the old ones get covered with a ſoft reſinous cruſt, called *barras*, when it is impure, and mixed with bits of bark, duſt and ſand; *gallipot*, when collected with more care; or white incenſe, when it is allowed to remain ſo long expoſed that it becomes reſinified, which is ſcraped off, and alſo collected for ſubſequent purification.

Both theſe products are purified by liquefaction and filtration. They conſiſt almoſt entirely of an eſſential oil and a reſin, and differ only in the proportions, the turpentine containing moſt oil, and the gallipot moſt reſin.

TEREBINTHINA.

Turpentines have different appellations, chiefly according to the country from which they are procured.

Balſam of Canada, from the *Pinus balſamea et Canadenſis.*
Reſina. (*Ed.*) *Balſamum Canadenſe.* (*Lond. Dub.*)
Cyprian turpentine, from the *Piſtacia terebinthus.*
Terebinthina Chia. (*Lond.*)
Straſburgh turpentine, from the *Pinus picea.*
Venice turpentine, from the *Pinus larix.*
Reſina. (*Ed.*) *Terebinthina Veneta.* (*Lond.*)
Common turpentine, from the *Pinus ſylveſtris.*
Terebinthina vulgaris. (*Lond. Dub.*)
Hungarian balſam, from the *Pinus ſylveſtris var. Mughos.*
Carpatian balſam, from the *Pinus cembra.*

None of theſe are properly balſams; which term is now uſed to expreſs thoſe oily reſinous ſubſtances only which contain benzoic acid. The Edinburgh college have denominated them reſins, but the proportion of eſſential oil which they contain is much too large to admit of the name, which ought to be confined to the other conſtituent, being applied to the compound with propriety. Therefore, until more attention ſhall be paid to this branch of nomenclature, we ſhall employ the common term of Turpentine.

All theſe ſpecies of turpentine poſſeſs the ſame general properties. They are more or leſs fluid, with different degrees of tranſparency; of a whitiſh or yellowiſh colour; a penetrating ſmell, and a warm, pungent, bitteriſh taſte. They are entirely ſoluble in alcohol; combine with fixed oil; and impart their flavour to water, but are not ſoluble in it. They are decompoſed by a moderate heat, being ſeparated into an eſſential oil and a reſin, and are exceedingly inflammable, burning with a large white flame, and much ſmoke.

Each ſpecies has ſome peculiarities. The Canadian is reckoned the beſt, and next to it the Chian. They are more tranſparent, and have a more agreeable flavour than the other ſorts. The common turpentine, as being the moſt offenſive, is rarely given internally; its principal uſe is in plaſters and ointments among farriers, and for the diſtillation of the eſſential oil.

Medical uſe.—Taken internally, they are active ſtimulants, increaſe the ſecretion of urine, to which they give the ſmell of violets, even though applied only externally, and open the bowels. They are principally recommended in gleets, the fluor albus, and the like; and by ſome in calculous complaints. In all caſes accompanied with inflammation, they ought to be abſtained from, as this ſymptom is increaſed, and not unfrequently oocaſioned, by them. Their doſe is from a ſcruple to a drachm and a half: they are moſt commodiouſly taken in the form of a bolus, or blended with watery liquors by the mediation of the yolk of an egg or mucilage.

But they are more frequently uſed externally as ſtimulants and diſcutients, and enter ſeveral officinal plaſters and ointments.

Off. prep.—Ol. volat. *Lond. Dub.* Ungt. infuſ. mel veſic, *Ed.* Emplaſt. mel. veſic. comp. *Ed.* Empl. litharg. comp. *Lond.* Ungt. elemi, *Lond. Dub.*

RESINA.

WHEN any of theſe turpentines loſes a conſiderable portion of their volatile oil, either by expoſure to the air, or by diſtillation, they become more conſiſtent, and acquire the name of reſins or roſin.

Thus. (*Lond.*) *Reſina alba.* (*Dub.*)
Common frankincenſe. White roſin.

THIS is the reſinous juice which exudes from the different ſpecies of fir trees, and is allowed to harden by expoſure to the air. It is a ſolid brittle reſin, brought to us in little globes or maſſes of a browniſh or yellowiſh colour on the outſide; internally whitiſh, or variegated with whitiſh ſpecks, of a bitteriſh, acrid, not agreeable taſte, without any conſiderable ſmell.

Off. prep.—Emplaſt. lad. comp. *Lond.* Emp. thuris comp. *Lond.* Emp. lith. comp. *Lond.*

RESINA PINI ABIETIS. (*Ed.*) *Pix burgundica.* (*Dub.*)
Burgundy pitch.

REAL burgundy pitch is collected, acoording to Tingry, from the pinus picea, or ſpruce fir tree. The reſinous juice which exudes from this ſpecies is leſs fluid, and leſs tranſparent than the proper turpentines. It is collected by the peaſants, ſtrained through cloths, and put into barrels. If its conſiſtence be too thick, it is mixed over the fire with a little turpentine, and oil of turpentine. A ſimple mixture of gallipot and barras made without heat, is often ſold under the name of Burgundy pitch, but the maſs reſulting from this combination ſoon becomes friable. It has neither the unctuoſity, viſcidity, tenacity, nor ſmell, which diſtinguiſh the real kind.

Although gallipot contains eſſential oil, the quantity is ſo ſmall that it is never diſtilled from it. It is purified by melting it with a very gentle fire, and filtrating it. By this proceſs it ſtill contains eſſential oil, and is often ſold by the name of Burgundy pitch. If boiling water be added to it after it is ſtrained, but while it is ſtill fluid, and they be agitated together till the maſs cools, we have a yellow reſin, which, from ſtill containing ſome eſſential oil, is preferred to that prepared by a ſimilar proceſs from the reſiduum of the diſtillation of turpentine.

Off. prep.—Emplaſt. picis burgund. *Ed. Lond. Dub.* Emplaſt. mel. veſic. comp. *Ed.*

Resina Flava. (*Lond. Dub.*) *Reſina alba.* (*Ed.*) *Reſina pini.* (*Ed.*)

Yellow roſin. Baked turpentine.

The proper turpentines contain a large proportion of volatile oil, which is often ſeparated from them by diſtillation.

The reſiduum of the diſtillation gets different names, according to ſome peculiarities in its treatment. When the diſtillation is performed without addition, and continued until the whole eſſential oil be driven off, and there appear ſome traces of empyreuma, the reſiduum is Fidlers Roſin, or Colophony; but if, while the maſs is ſtill fluid, a quantity of water be added, and thoroughly blended with the reſin by long and conſtant agitation, it it then called Yellow Roſin.

At Queensferry, in this neighbourhood, there is a conſiderable turpentine work. The turpentine uſed comes from America. The under part of the cake of the reſiduum of the diſtillation reſembles fidlers roſin, the action of the fire having entirely expelled the water and volatile oil, and rendered it ſlightly empyreumatic and tranſparent, while the upper part, from retaining ſome water, is opaque and yellow.

Off. prep.—Ungt. reſinos, *Ed. Lond. Dub.* Empl. ſimp. *Ed.* Emp. ceræ, *Lond. Dub.* Emp. picis burgund. *Lond. Dub.* Ungt. inf. mel veſic, *Ed.* Emp. mel veſic, *Ed.* Emp. reſinos, *Ed.* Emp.

lith. cum reſina, *Lond.* Emp. hydrarg. *Ed.* Emp. oxidi ferri rubri, *Ed.*

Oleum Terebinthinæ Volatile. (*Ed.*) *Oleum terebinthinæ.* (*Lond. Dub.*)

Oil of turpentine.

In the Edinburgh Pharmacopœia this eſſential oil is officinal: by the other colleges directions are given for its preparation.

It is lighter than water, tranſparent, limpid, and volatile. It has a hot pungent taſte, and a penetrating ſmell; is highly inflammable, and poſſeſſes all the other properties of eſſential oils.

It is remarkably difficult of ſolution in alcohol, although turpentine itſelf diſſolves eaſily. One part of the volatile oil is indeed apparently taken up by ſeven of alcohol, but on ſtanding, the greateſt part of the oil falls to the bottom, a much larger quantity being neceſſary to retain it in ſolution.

Med. uſe.—As a medicine, it is highly ſtimulating and penetrating. Internally it acts as a diuretic or ſudorific in very ſmall doſes. It has, however, been given in much larger doſes, eſpecially when mixed with honey. Recourſe has principally been had to ſuch doſes in caſes of chronic rheumatiſm, particularly in thoſe modifications of it which are ſtyled *ſciatica* and *lumbago*. But they have not been often ſucceſsful, and ſometimes they have had the effect of inducing bloody urine.

Externally, it often produces excellent effects as a diſcutient in indolent tumours; as a ſtimulus in paralyſis of the extremities, and in bruiſes; as an antiſpaſmodic, and as a ſtyptic, when applied as hot as the patient can bear it, on compreſſes directly to the bleeding mouths of the veſſels.

Off. prep.—Ol. tereb. puriff. *Ed. Lond. Dub.*

Extractum.

Extract.

A fluid extract prepared by decoction from the twigs of the pinus ſylveſtris, is the well-known eſſence of ſpruce, which, fermented with molaſſes, forms the faſhionable beverage of Spruce beer.

Resina Empyreumatica. *Reſina pini ſylveſtris.* (*Ed.*) *Pix liquida.* (*Lond. Dub.*)

The laſt kind of products from the different ſpecies of fir are obtained by the action of fire. With this view, a conical cavity is dug out in the earth, communicating at the bottom with a reſervoir. Billets or thin laths of wood are then placed, ſo as not only to fill the cavity, but to form a conical pile over it, which is covered with turf, and kindled at the top. The admiſſion of air is ſo regulated, that it burns from above downwards, with a ſlow and ſmothered combuſtion. The ſmoke and vapours formed are obliged to deſcend into the excavation in the ground, where they are condenſed, and paſs along with the matters liquefied into the receiver. This mixture is denominated Tar; and the wood itſelf is reduced to charcoal. By long boiling, tar is deprived of its volatile parts, and converted into pitch.

Tar is a mixture of reſin, empyreumatic oil, charcoal, and acetous acid. Its colour is derived from the charcoal; and the other properties in which it differs from a common reſin, depend on the preſence of acetous acid and empyreumatic oil. The acid itſelf is not only ſoluble in water, but it alſo renders the empyreumatic oil ſoluble in larger quantities than it otherwiſe would be.

Medical uſe.—Tar water is a heating diuretic and ſudorific remedy, but by no means ſo powerful, or ſo generally admiſſible as it was repreſented by biſhop Berkley. Tar is applied externally in tinea capitis, and ſome other cutaneous diſeaſes.

Off. prep.—Ungt picis, *Ed. Lond. Dub.*

But the moſt remarkable production is that of a real gum, entirely ſoluble in water, from a tree ſo reſinous as the Pinus larix. It is prepared in the Ural larch foreſts; and exudes, according to Profeſſor Pallas, from the interior parts of the wood when it is burning.

PIPER.

Willd. g. 74. *Diandria Trigynia.*—Nat. ord. *Piperitæ.*

Sp. 1. PIPER NIGRUM. *Bacca.* (*Lond.*) *Fructus.* (*Ed.*) *Semina.* (*Dub.*)

Black pepper. The berry.

THE black pepper is the fruit of a ſhrubby creeping plant, which grows wild in the Eaſt Indies, and is cultivated in Java and Malabar, by which means the fruit is much improved. The berries are gathered before they are ripe, and are dried in the ſun. They become black and corrugated on the ſurface; their taſte is hot and fiery; and their ſmell ſlightly aromatic.

According to Dr. Thomſon, it contains cinchonin, and another analogous principle. Neumann got from 7680 parts, 4800 watery, and afterwards 180 alcoholic extract, and inverſely 1080 alcoholic, and 3640 watery. The principle on which its pungency depends, was ſoluble both in water and in alcohol, and was not volatile, for 7680 grains furniſhed about 150 of a very bland volatile oil.

White pepper is the fruit of the ſame plant, gathered after it is fully ripe, and freed of its external coat by maceration in water. It is ſmooth on the ſurface, and leſs pungent than the black pepper.

Off. prep.—Emplaſt. mel. veſic. comp. *Ed.*

Sp. 3. Piper Cubeba. *Cubeba.* (*Lond.*)
Cubebs.

Cubebs are a fruit brought from Java. This fruit has a great reſemblance to pepper. The principal difference diſtinguiſhable by the eye, is, that each cubeb is furniſhed with a long ſlender ſtalk, whence they are called by ſome *piper caudatum.* In aromatic warmth and pungency, cubebs are far inferior to pepper.

Neumann got from 960 grains, 310 alcoholic, and 272 watery extract, and inverſely 380 watery, and 61 alcoholic. It alſo furniſhes ſome volatile oil.

Sp. 12. Piper Longum. *Fructus.* (*Lond. Ed.*) *Semina.* (*Dub.*)
Long pepper. The fruit.

The plant which bears the long pepper is alſo a ſarmentaceous climber. The berries are ſmall round grains, diſpoſed ſpirally in a long cylindrical head. They are gathered before they are ripe, and dried, and are the hotteſt of all the peppers.

The warmth and pungency of theſe ſpices reſide entirely in a reſin; their aromatic odour in an eſſential oil. In medicine they are ſometimes employed as acrid ſtimulants; but their chief uſe is in cookery as condiments.

Off. prep.—Tinct. cin. comp. *Ed. Lond. Dub.* Confect. opiat, *Lond.* Pulv. aromat. *Lond. Dub.* Pulv. cret. comp. *Lond.*

PISTACIA.

Dioecia Pentandria.—Nat. ord. *Amentaceæ.*

Sp. Pistacia Terebinthus. *Terebinthina Chia.* (*Lond.*)
Chian turpentine.

The tree which yields this turpentine grows in India, the north of Africa, and ſouth of Europe, but the turpentine is principally collected in the iſlands of Chios and Cyprus, by wounding the tree. It does not differ in any thing material, except its price, from the other turpentines.—See Pinus.

Sp. Pistacia Lentiscus. *Reſina.* (*Ed.*) *Maſtiche.* *Reſina.* (*Lond.*)
Maſtich. A reſin.

This ſpecies is a native of the ſame countries with the former. It is obtained principally in the iſland of Chios, by making tranſverſe inciſions in the tree, and allowing the juice to harden. It is brought in ſmall yellowiſh, ſemi-tranſparent, brittle grains; of a ſmooth and ſhining fracture, ſoftening when chewed, fuſible, burning with a pleaſant ſmell, inſoluble in water, and partially ſoluble in alcohol and fixed oils. Neumann found that during digeſtion with alcohol, a portion ſeparates inſoluble in alcohol, though in appearance reſinous, amounting to about one tenth of the maſtich. This is probably the ſame with the ſubſtance found in Sandarach by Mr. Gieſe, and called Sandaracha by Dr. Thomſon.

Its flavour is communicated to water. It is therefore a reſin, combined with a little eſſential oil. It is principally uſed by the Turkiſh women as a maſticatory, to preſerve the teeth, and give a pleaſant ſmell to the breath.

PLUMBUM. (*Ed. Lond.*)
Lead.

The general properties of lead have been already enumerated. Lead is found,

I. Oxidized:
  1. Lead ochre of different colours.

II. Oxidized, and combined with acids.
  2. Carbonated lead. White lead ſpar.
  3. Murio-carbonated.
  4. Phoſphated lead. Green lead ore.
  5. Arſeniated lead.
  6. Arſenio-phoſphated lead.
  7. Molybdated lead.
  8. Sulphated lead.

III. Sulphuretted:
  9. Sulphuretted lead. Galena.
  10. Sulphuretted oxide of lead.

Lead is obtained by various proceſſes from theſe ores. In its metallic form it is ſcarcely an officinal article, as its different oxides are purchaſed from the manufacturers, and never prepared by the apothecary.

Its effects on the body are emaciation, violent colics, paralyſis, tremors, and contractions of the limbs; and as they generally come on gradually, the cauſe is ſometimes overlooked till it be too late. Poiſoning from lead is never intentional, but only accidental, either from liquors becoming impregnated with lead, by being improperly kept in veſſels lined or glazed with lead, or to which lead has been criminally added to correct its acidity; or among manufacturers who work much with lead, as painters and plumbers, and who are not ſufficiently attentive to avoid ſwallowing any of it.

The preſence of lead in any ſuſpected liquor is detected by the hydro-ſulphuret of potaſs, which forms with it a brown precipitate, not ſoluble in diluted muriatic acid; and ſtill more certainly by evaporating a portion of it to dryneſs, and expoſing the extract to a heat ſufficient to reduce the lead.

OXIDUM PLUMBI ALBUM. (*Ed.*) *Ceruſſa.* (*Lond. Dub.*)
White oxide of lead. Ceruſſe.

THIS ſubſtance, which is now ſaid to be a carbonate of lead, is manufactured in ſeveral countries. It is prepared by expoſing lead to the vapour of vinegar. To accelerate the oxidizement, the lead is caſt in thin plates, which are rolled up ſpirally. A number of theſe are placed perpendicularly on a ſupport, over a flat veſſel containing vinegar, which is converted into vapour by a gentle heat, ſuch as that of dung. The plates become ſlowly covered with a white cruſt, which is in due time removed; and the remains of the plates again expoſed to the vapour of vinegar, until they be entirely corroded.

White oxide of lead has a ſcaly or foliated texture, is brittle, friable, heavy, of a ſnowy whiteneſs, and a ſweet taſte. It is often adulterated with earthy ſubſtances, which may be diſcovered by mixing it with oil, and reducing the lead in a crucible. Although very friable, the coarſer particles cannot be ſeparated by means of a ſieve, becauſe its interſtices ſoon get filled up. It can only be obtained in the ſtate of a fine powder, by rubbing a loaf of ceruſſe on a ſieve placed over a ſheet of paper.

In pharmacy the white oxide of lead is uſed in the compoſition of ointments and plaſters.

Off. prep.—Acetis plumbi, *Ed. Lond. Dub.* Ungt. oxidi plumbi albi, *Ed.* Pulv. ceruſſæ comp. *Lond.*

OXIDUM PLUMBI RUBRUM. (*Ed.*) *Minium.* (*Lond.*)
Red oxide of lead.

THE preparation of red-lead is ſo troubleſome and tedious, as ſcarce ever to be attempted by the apothecary or chemiſt; nor indeed is this commodity expected to be made by them, the preparation of it being a diſtinct branch of buſineſs. The makers melt large quantities of lead at once, upon the bottom of a reverberatory furnace built for this purpoſe, and ſo contrived, that the flame acts upon a large ſurface of the metal, which is continually changed by the means of iron-rakes drawn backwards and forwards, till the fluidity of the lead is deſtroyed; after which, the oxide is only now and then turned.

The red oxide of lead is obtained in the form of a very heavy powder, conſiſting of minute ſhining ſeales, of a bright ſcarlet, verging towards yellow, eſpecially if triturated. It is ſometimes adulterated with red oxide of iron, red bole, or powdered brick. Theſe frauds are detected by the inferiority of colour, by mixing it with oil, and ſubjecting it to the teſt of reduction; and by its forming a black precipitate with tincture of galls when diſſolved in nitrous acid.

OXIDUM PLUMBI SEMIVITREUM. (*Ed.*) *Lithargyrus.* (*Lond. Dub.*)

Semi-vitrified oxide of lead. Litharge.

IF oxidized lead be urged with a haſty fire, it melts into the appearance of oil, and on cooling concretes into litharge. Greateſt part of the litharge met with in the ſhops, is produced in the purification of ſilver from lead, and the refining of gold and ſilver by means of this metal. According to the degree of fire and other circumſtances, it proves of a pale or deep colour; the firſt has been commonly called Litharge of Silver, the other Litharge of Gold.

The oxides of lead diſſolve by heat, in expreſſed oils; theſe mixtures are the baſis of ſeveral officinal plaſters and ointments.

Lead and its oxides when undiſſolved, have no conſiderable effects as medicines. Diſſolved in oils, they are ſuppoſed to be (when externally applied) anti-inflammatory and deſiccative. Combined with vegetable acids, they are remarkably ſo; and taken internally, prove powerful though dangerous ſtyptics.

Off. prep.—Litharg. ppt. *Ed. Dub.* Aqud. lith. acet. *Lond. Dub.* Emplaſt. *Ed. Lond. Dub.* Cerat. ſaponis, *Lond. Dub.*

POLYGALA SENEGA. *Radix.* (*Ed.*) *Seneka. Radix.* (*Lond. Dub.*)

Seneka, or Rattleſnake Root.

Diadelphia Octandria.—Nat. ord. *Lomentaceæ.*

SENEKA is a perennial plant, which grows wild in North America, particularly Virginia and Pennſylvania. This root is uſually about the thickneſs of the little finger, variouſly bent and contorted, and appears as if compoſed of joints, whence it is ſuppoſed to reſemble the tail of the animal whoſe name it bears; a kind of membraneous margin runs on each ſide, the whole length of the root.

The bark is the active part of the root. Its taſte is at firſt acrid, afterwards very hot and pungent. It has no ſmell.

Its acrimony reſides in a reſin; for it is entirely extracted by alcohol; is precipitated by water; does not riſe in diſtillation; and is not deſtroyed by keeping.

Medical uſe.—It is an active ſtimulus, and increaſes the force of the circulation, eſpecially of the pulmonary veſſels. It has therefore been found uſeful in typhoid inflammations of the lungs: but it is apt to diſorder the ſtomach, and to induce diarrhœa. Dr. Brandreth of Liverpool has derived great benefit in ſome caſes of lethargy from an extract of ſeneka combined with carbonate of ammonia.

Some have likewiſe employed this root in hydropic caſes, and not without ſucceſs. There are examples of its occaſioning a plentiful evacuation by ſtool, urine, and perſpiration; and by this means removing the diſeaſe, after the common diuretics and hydragogues had failed.

The Senegaro Indians are ſaid to prevent the fatal effects of the bite of the rattleſnake, by giving it internally, and by applying it externally to the wound.

The uſual doſe of the powder is thirty grains or more.

Externally, it has been advantageouſly uſed as a ſtimulating gargle in croup.

Off. prep.—Decoct. *Ed.*

POLYGONUM BISTORTA. *Radix.* (*Ed.*) *Biſtorta. Radix.* (*Dub. Lond.*)

Great biſtort, or ſnakeweed. The root.

Willd. g. 785. *ſp.* 3. *Octandria Trigynia.*—Nat. ord. *Oleraceæ.*

THIS plant is perennial, and grows wild in moiſt meadows in ſeveral parts of Britain. The root is about the thickneſs of the little finger, of a blackiſh-brown colour on the outſide, and reddiſh within: it is writhed or bent vermicularly (whence the name of the plant) with a joint at each bending, and full of buſhy fibres; the root of the ſpecies here mentioned has, for the moſt part, only one or two bendings; others have three or more. All the parts of biſtort have a rough auſtere taſte, particularly the root, which is one of the ſtrongeſt of the vegetable aſtringents.

Med. uſe.—It is employed in all kinds of immoderate hæmorrhagies and other fluxes, both internally and externally, where aſtringency is the only indication. It is certainly a very powerful ſtyptic, and is to be looked on ſimply as ſuch. To the ſudorific, antipeſtilential, and other virtues attributed to it, it has no other claim than in conſequence of its aſtringency, and of the antiſeptic power which it has in common with other vegetable ſtyptics. The largeſt doſe of the root in powder is one drachm.

POLYPODIUM FILIX MAS. *Radix.* (*Ed.*) *Filix. Radix.* (*Lond.*) *Filix Mas. Radix.* (*Dub.*)

Male fern. Male polypody. The root.

Cryptogamia. Filices.—Nat. ord. *Filices.*

THIS fern is perennial, and grows in great abundance in almoſt every part of Britain where the ground is not cultivated. The greateſt part of the root lies horizontally, and has a great number of appendages placed cloſe to each other in a vertical direction, while a number of ſmall fibres ſtrike downwards. The large root, together with its appendages, are to be reſerved for uſe. The two ends, however, are to be cut off, the one being too old and ſpongy, the other too new and green.

When chewed, its taſte is ſomewhat mucilaginous and ſweet, and afterwards ſlightly aſtringent and bitter. Its ſmell is alſo weak.

Medical uſe.—This root was uſed as an anthelmintic in the days of Dioſcorides. It gradually became neglected; but its uſe was again revived at different times by Madame Nuffer, Herrenſchwand, and others, who certainly frequently ſucceeded in killing and expelling the tænia, both lata and cucurbitina, by the exhibition of ſecret remedies, of which the fern-powder was, or rather was ſuppoſed to be, the principal ingredient; for there is much reaſon to believe, that the active purgatives with which it was always combined, were really the remedies which effected the cure.

The ſame, or nearly a ſimilar, ſecret, has been bought by different potentates, and publiſhed for the benefit of thoſe ſuffering under this obſtinate diſeaſe.

The internal ſolid part of the root only is to be powdered, and the powder ſhould have a reddiſh colour; and as the doſe and exhibition of the remedy muſt be regulated according to the age, ſex, and conſtitution, of the patient, it muſt be given always under the direction of an experienced practitioner.

POTENTILLA REPTANS. *Pentaphyllum. Radix.* (*Lond.*) Common cinquefoil.

Willd. g. 1000. *ſp.* 34. *Icoſandria Polygamia.*—Nat. ord. *Senticoſæ.*

THIS plant is perennial, and grows plentiful in hedges, and by road ſides. The root is moderately aſtringent, and as ſuch is ſometimes given internally in diarrhœas and other fluxes, and employed in gargariſms for ſtrengthening the gums, &c. The cortical part of the root may be taken, in ſubſtance, to the quantity of a drachm: the internal part is conſiderably weaker, and requires to be given in double the doſe to produce the ſame effect; and as we poſſeſs many more powerful aſtringents, the cinquefoil is but little uſed.

PRUNUS.

Willd. g. 982. *Icoſandria Monogynia.*—Nat. ord. *Pomaceæ.*

Sp. 29. PRUNUS DOMESTICA. *Fructus.* (*Ed.*) *Prunus Gallica. Fructus*, Prunum Gallicum *dictus.* (*Lond. Dub.*)

Plumb tree. The fruit. French prunes.

THIS tree is found wild in hedges in England, but has probably originated from the ſtones of the cultivated kinds being dropt there by accident. Great quantities of the dried ſruit are imported from the continent, but the French prunes are reckoned the beſt.

Medical uſe.—They contain much mucilaginous and ſaccharine matter, and their medical effects are, to abate heat, and gently looſen the belly, which they perform by lubricating the paſſages, and ſoftening the excrement. They are of conſiderable ſervice in coſtiveneſs, accompanied with heat or irritation, which the more ſtimulating cathartics would tend to aggravate: where prunes are not of themſelves ſufficient, their action may be promoted by joining with them a little rhubarb or the like; to which may be added ſome carminative ingredient to prevent their occaſioning flatulency.

Off. prep.—Elect. ſennæ, *Ed. Lond. Dub.*

Sp. 32. Prunus Spinosa. *Prunus ſylveſtris. Fructus.* (*Lond.*)
The ſloe tree. The fruit.

The ſlow alſo grows wild in Britain. The fruit has a very aſtringent ſouriſh taſte. It contains malic acid. The inſpiſſated juice of the unripe fruit is very aſtringent, and is called *Acacia Germanica.* An infuſion of a handful of the flowers is a ſafe and eaſy purge. The powdered bark will ſometimes cure agues.

Off. prep.—Conſerva, *Lond.*

PTEROCARPUS.

Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*

Sp. Pterocarpus Santalinus. *Lignum.* (*Ed.*) *Santalum rubrum. Lignum.* (*Lond. Dub.*)
Red ſaunders. The wood.

This tree grows in the Eaſt Indies, and acquires a very large ſize. The wood is brought in large billets, of a compact texture, a dull red, almoſt blackiſh colour on the outſide, and a deep brighter red within. It has no manifeſt ſmell, and little or no taſte. It communicates a deep red to rectified ſpirit, but gives no tinge to aqueous liquors: a ſmall quantity of the reſin, extracted by means of ſpirit, tinges a large one of freſh ſpirit, of an elegant blood red. Neumann got from 960 grains 210 alcoholic, and afterward 20 of watery extract; and inverſely, 126 tough watery extract, and 120 alcoholic. According to the ſame chemiſt, it gives out its colouring matter to volatile oil of lavander, but not to volatile oil of turpentine. Is this difference to be aſcribed to the camphor contained in the former?

Off. prep.—Tinct. lav. comp. *Ed. Lond. Dub.*

Sp. PTEROCARPUS DRACO. *Reſina.* (*Ed.*) *Sanguis draconis. Reſina,* (*Lond.*)

Dragons blood. A reſin.

THIS is alſo a very large tree. It is a native of South America, and the reſin which exudes from inciſions made in its bark uſed to be frequently ſent from Carthagena to Spain. It is however doubtful, if the dragons blood of the ſhops be produced from this tree, as many others furniſh a ſimilar reſin, as the dracæna draco, dalbergia monetaria, and eſpecially the calamus draco, which probably furniſhes all that is brought from the Eaſt Indies.

The beſt dragons blood is not in cakes, but is brought in ſmall maſſes, of the ſize of a nutmeg, wrapt up in the dried leaves of ſome kind of reed, breaks ſmooth, free from any viſible impurities, of a dark-red colour, which changes, upon being powdered, into an elegant bright crimſon. This drug, in ſubſtance, has no ſenſible ſmell or taſte: when diſſolved, it diſcovers ſome degree of warmth and pungency. It is fuſible and inflammable, and totally ſoluble in alcohol, tinging a large quantity of the menſtruum of a deep red colour. It is likewiſe ſoluble in expreſſed oils, and gives them a red hue, leſs beautiful than that communicated by anchuſa. It is not acted upon by water, but precipitated by it from its alcoholic ſolution. I find that it is ſoluble in nitrous acid and alkalies, and that it neither precipitates gelatin, nor affects the colour of the ſalts of iron. It therefore appears to be a pure reſin without any aſtringency. I have been more particular in proving that this reſin is not aſtringent becauſe both Mr. Murray and Dr. Thomſon have adopted Mr. Prouſt's account of it. But the ſubſtance examined by Mr. Prouſt could not be the reſin known in this country by the name of Dragons blood, as it was as ſoluble in water as in alcohol. Dr. Fothergill, who firſt deſcribed kino, received it as the fineſt dragons blood. Something ſimilar muſt have happened to Mr. Prouſt, as the characters of his *ſang dracon* correſpond with thoſe of kino.

Off. prep.—Emp. thuris comp.

PUNICA GRANATUM. *Cortex fructûs. Flores pleni,* Balauſtia *dicti.* (*Ed.*) *Granatum. Floris petalum,* Balauſtium *dictum. Fructûs cortex.* (*Lond.*) *Flores,* Balauſtia *dicti. Pericarpii cortex.* (*Dub.*)

Pomegranate. The outer rind of the fruit. The double flowers, called Balauſtine.

Willd. g. 980. *ſp.* 1. *Icoſandria Monogynia.*—Nat. ord. *Pomaceæ.*

THE pomegranate is a low tree, or rather ſhrub, growing wild in Italy and other countries in the ſouth of Europe; it is ſometimes met with in our gardens; but the fruit, for which it is chiefly valued, rarely comes to perfection. This fruit has the general qualities of the other ſweet ſummer fruits, allaying heat, quenching thirſt, and gently looſening the belly. The rind is a ſtrong aſtringent, ſtriking a permanent blue with ſulphate of iron, and as ſuch is occaſionally made uſe of. The flowers are of an elegant red colour, in appearance reſembling a dried red roſe. Their taſte is bitteriſh and aſtringent. They are recommended in diarhœas, dyſenteries, and other caſes where aſtringent medicines are proper.

PYRUS CYDONIA. *Cydonia Malus. Fructus, ejusque ſemen. (Lond.)*

The quince. The fruit and ſeeds.

Willd. g. 992. *ſp.* 17. *Icoſandria Pentagynia.*—Nat. ord. *Pomaceæ.*

The quince is originally a native of Crete, but ripens its fruit perfectly in England.

Quinces have a very auſtere acid taſte: taken in ſmall quantity, they are ſuppoſed to reſtrain vomiting and alvine fluxes; and more liberally, to looſen the belly. The ſeeds abound with a mucilaginous ſubſtance of no particular taſte, which they readily impart to watery liquors; an ounce will render three pints of water thick and ropy like the white of an egg. They will not however ſupply the place of gum-arabic, becauſe their mucilage ſpoils very quickly, and is precipitated by acids.

Off. prep.—Mucilago. *Lond.*

QUASSIA.

Willd. g. 849. *Decandria Monogynia*—Nat. ord. *Gruinales.*

Sp. 2. QUASSIA SIMARUBA. *Cortex. (Ed.) Simarouba. Cortex. (Lond.) Cortex, lignum. (Dub.)*

Mountain or bitter damſon. The bark.

This tree grows in Guiana and in Jamaica. The ſimarouba of the ſhops is the bark of the root of this tree, and not of the quaſſia amara, as ſtated by the Dublin college. It is brought to us in pieces ſome feet long, and ſome inches broad, folded lengthwiſe. It is light, fibrous, very tough; of a pale yellow on the inſide; darker coloured, rough, ſcaly, and warted on the outſide; has little ſmell, and a bitter, not diſagreeable, taſte. It gives out its bitterneſs both to alcohol and water.

Medical uſe.—It has been much celebrated in obſtinate diarrhœa, dyſentery, anorexia, indigeſtion, lienteria, and intermittent fevers; but it is doubtful that it is better than other bitters.

It is given in powder, in doſes of half a drachm, or a whole drachm; but it is too bulky, and very difficultly pulverizable. It is beſt exhibited in decoction. Two drachms of the bark may be boiled in two pounds of water to one, and the decoction drunk in cupfuls in the courſe of the day.

Sp. 3. Quassia Excelsa. *Lignum.* (*Ed.*) *Quaſſia. Lignum, Cortex, Radix.* (*Lond.*)

Quaſſia, the wood, bark, and root.

This tree grows in Jamaica, and in the Caribæan iſlands. The quaſſia of the ſhops is the wood of its root, and not of the quaſſia amara, which is a very rare tree, but ſurpaſſes all others in bitterneſs.

This root is about the thickneſs of a man's arm: its wood is whitiſh, becoming yellowiſh by expoſure to the air. It has a thin, grey, fiſſured, brittle bark, which is deemed in Surinum more powerful than the wood. Quaſſia has no ſenſible odour, but is one of the moſt intenſe, durable, pure bitters known. Its infuſion, decoction, and tincture, are almoſt equally bitter and yellowiſh, and are not blackened by chalybeates. The properties of the extract of quaſſia have been detailed by Dr. Thomſon, under the title of the bitter principle.

Med. uſe.—It is a very pure and ſimple bitter, and may be given in all caſes where bitters are proper. It has been exhibited in intermittent and bilious fevers, in ſtomachic complaints, in lienteria, in cachexy, dropſies, leucorrhœa, and gout. It is much uſed in this country to give the bitterneſs to malt liquors, though it ſubjects thoſe brewers who employ it to a very heavy penalty.

It can ſcarcely be reduced to a ſufficiently fine powder to be given in ſubſtance, and is therefore generally given in the form of infuſion, decoction, or extract.

QUERCUS.

Monoecia Polyandria.—Nat. ord. *Amentaceæ.*

Sp. Quercus Robur. *Cortex.* (*Ed.*) *Quercus. Cortex.* (*Lond. Dub.*)

Oak. The bark.

The oak grows wild in Britain. The ſuperior excellence of its wood for ſhip-building has rendered its cultivation an object of national concern. Its ſaw-duſt is an uſeful dye ſtuff, and its bark is the principal article uſed in tanning.

Medical uſe.—The bark is a ſtrong aſtringent, and is recommended in hæmorrhagies, alvine fluxes, and other preternatural or immoderate ſecretions. In theſe it is ſometimes attended with good effects. But it is by no means capable of being employed as a ſubſtitute, in every inſtance, for Peruvian bark, as ſome have aſſerted; and indeed it is ſo difficultly reduced to a ſufficiently fine powder, that it can ſcarcely be given internally in ſubſtance.

Off. prep.—Extract. *Dub.*

Sp. Quercus Cerris. *Cyniphis nidus.* (*Ed.*) *Gallæ.* (*Lond.*) *Gallæ, Cynipidum nidi.* (*Dub.*)

Oriental oak. The neſt of the cynips quercifolii.

This ſpecies of oak is a native of the Levant, and of the warmer countries of Europe.

The cynips quercifolii, a hymenopterous inſect, depoſits its eggs in the leaves and other tender parts of the tree. Around each puncture an excreſcence is preſently formed, within which the egg is hatched, and the inſect paſſes through all the ſtages of its metamorphoſis, until it become a perfect inſect, when it eats its way out of its priſon. Theſe excreſcences are called galls, or gall-nuts. They are of different ſizes, ſmooth or knotty on the ſurface, of a whitiſh, reddiſh, or blackiſh colour, and generally penetrated with a ſmall hole. Internally they conſiſt of a ſpongy, but hard, more or leſs brown ſubſtance, and they have a very rough aſtringent taſte. Good galls are of a blackiſh-grey or yellow colour, heavy, and tuberculated on the ſurface. They are the moſt powerful aſtringents we poſſeſs; and, ſince the diſcovery of the tanning principle by Mr. Seguin, have very much engaged the attention of chemiſts. But the moſt accurate analyſis is that of Mr. Davy, who found that 500 grains of good Aleppo galls gave, by lixiviating them until their ſoluble matters were taken up, and evaporating the ſolution ſlowly, 185 grains of ſolid matter, which, when examined by analyſis, appeared to conſiſt of,

Tannin,	130
Mucilage, and matter rendered inſoluble by evaporation,	12
Gallic acid, and a little extractive matter,	31
Remainder calcareous earth and ſaline matter,	12

From my experiments, I am diſpoſed to think that Mr. Davy has under-rated the tannin of nut-galls; for by ſimple repeated infuſions in hot water, the reſiduum of 500 grains in one experiment amounted only to 158, and in another only to 136. The quantity of tannin eſtimated in Mr. Davy's way amounted, in the firſt to 221 grains, and in the ſecond to 256. The great difference in theſe reſults from Mr. Davy's muſt be entirely aſcribed to ſome differences in the galls themſelves, or in the mode of operation. A ſaturated decoction of galls, in cooling, depoſits a copious pale yellow precipitate, which ſeems to be purer tannin than can be got by any other proceſs. Neumann got from 960 grains of coarſely powdered galls 840 watery extract, and afterwards only 4 alcoholic; and inverſely, 760 alcoholic and 80 watery.

Medical uſe.—An infuſion or decoction of galls may be uſed with advantage as an aſtringent gargle; and an ointment of one part of finely powdered galls to eight of any ſimple ointment is applied with ſucceſs in hæmorrhoidal affections.

RHAMNUS CATHARTICUS. *Baccarum ſuccus.* (*Ed.*) *Spina Cervina. Bacca.* (*Lond.*)

Purging buckthorn. The berry. The juice of the berries.

Willd. g. 405. *ſp.* 1. *Pentandria Monogynia.*—Nat. ord. *Dumoſæ.*

This tree, or buſh, is common in hedges: it flowers in June, and ripens its fruit in September or the beginning of October. In our markets, the fruit of ſome other trees, as the blackberry bearing alder, and the dogberry tree, have of late been frequently mixed with, or ſubſtituted for, thoſe of buckthorn. This abuſe may be diſcovered by opening the berries; thoſe of buckthorn have almoſt always four ſeeds, the berries of the alder two, and thoſe of the dogberry only one. Buckthorn berries, bruiſed on white paper, ſtain it of a green colour, which the others do not. Thoſe who ſell the juice to the apothecaries, are ſaid to mix it with a large proportion of water.

Medical uſe.—Buckthorn berries have a faint diſagreeable ſmell, and a nauſeous bitter taſte. They have long been in conſiderable eſteem as cathartics: and celebrated in dropſies, rheumatiſms, and even in the gout: thongh in theſe caſes they have no advantage above other purgatives, but are more offenſive, and operate more ſeverely, than many which the ſhops are furniſhed with. They generally occaſion gripes, ſickneſs, dry the mouth and throat, and leave a thirſt of long duration. The doſe is about twenty of the freſh berries in ſubſtance, and twice or thrice this number in decoction; an ounce of the expreſſed juice, or a drachm of the dried berries.

Off. prep.—Syr. rhamni cathart. *Ed. Lond.*

RHEUM PALMATUM. *Radix.* (*Ed.*) *Rhabarbarum. Radix.* (*Lond. Dub.*)

Palmated rhubarb. The root.

Willd. g. 808. *ſp.* 5. *Enneandria Monogynia.*—Nat. ord. *Oleraceæ.*

This plant grows ſpontaneouſly in China, and endures the colds of our climate.

But it is not aſcertained that the Chineſe or Ruſſian rhubarb is the dried root of this plant. Pallas thinks that it is obtained indiſcriminately from the rheum undulatum, palmatum, and compactum, more eſpecially from the firſt; while Mr. Severs, an apothecary who was ſent by Catharine II on purpoſe to obtain the true rhubarb plant, and travelled for ſeveral years in the countries contiguous to that whence the rhubarb is brought, is of opinion, that the botanical characters of the plant which furniſhes it are ſtill unknown, excepting that it is ſaid not to grow to a great ſize, and to have round leaves, which are toothed on the edges with almoſt ſpinous points.

All the rhubarb of commerce is brought from the Chineſe town Sini, or Selim, by the Bucharians. It grows on the neighbouring chain of lofty mountains which ſtretches to the lake Koko-Nor, between 35° and 40° north latitude. It is dug up by the poor peaſants, cleaned from the earth, cut in pieces, ſtrung with the bark on ſtrings, and expoſed to dry under cover in the ſhade for a whole year, before it is again cleaned and prepared for exportation.

There is a diſtinction made in commerce between the Ruſſian and Chineſe rhubarb, although they both come from the ſame country.

The Ruſſian is dearer, and always good, as very great attention is paid both in purchaſing and tranſporting it, by order of the government. In Kiachta, on the Ruſſian frontier, it is received from the Bucharians by a Ruſſian apothecary, who examines it. The bad is immediately burnt, and the good is freed from its bark, woody parts, and every impurity, in the moſt careful manner. It is then ſent to Moſcow and to Peterſburgh, where it is again examined.

It is commonly in round pieces, of a reddiſh or whitiſh yellow colour, feels gritty between the teeth, and is often perforated with ſo large a hole, that many pieces have the appearance of a bark.

The Chineſe or Eaſt-Indian rhubarb is brought by ſea from Canton. It is heavier, harder, and more compact, than the other; ſeldom perforated with holes, and either in long pieces, or with two flat ſides, as if they had been compreſſed. Dr. Lewis thinks that this is leſs aromatic, but ſtronger, than the Turkey; and that it has required leſs care in drying from having been lifted when the root was leſs watery.

The general characters of good rhubarb are, its having a whitiſh or clear yellow colour, being dry, ſolid, and compact, moderately heavy; brittle; when recently broken appearing marked with yellow or reddiſh veins, mixed with white; being eaſily pulverizable; forming a powder of a fine bright yellow, having the peculiar, nauſeous, aromatic ſmell of rhubarb, and a ſub-acrid, bitteriſh, ſomewhat aſtringent taſte, and when chewed feeling gritty under the teeth, ſpeedily colouring the ſaliva, and not appearing very mucilaginous. The ſize and form of the pieces are of little conſequence; only we muſt break the large ones, to ſee that they are not decayed or rotten within; and we muſt alſo obſerve that they are not muſty or worm-eaten. This is the more neceſſary, as damaged pieces are frequently ſo artfully dreſſed up, and coloured with powdered rhubarb, as to impoſe on the buyer.

The principal conſtituent of rhubarb is extractive matter, ſoluble both in alcohol and in water. By gentle decoction, it loſes above one half its weight. Rhubarb alſo contains ſome volatile odorous matter, on which its peculiar nauſeous ſmell, and its activity as a purge, depend; for when diſſipated, either by age or any preparation to which the rhubarb has been ſubjected, the powers of the medicine are almoſt deſtroyed. It alſo contains ſome tannin, and about one ſixth of its weight of oxalate of lime. Neumann got from 480 grains 180 of alcoholic, and afterwards 170 watery extract; and inverſely, 350 watery and only 5 of alcoholic extract.

Medical uſe.—Rhubarb is a mild cathartic, which operates without violence or irritation, and may be given with ſafety even to pregnant women, and to children. In ſome people, however, it occaſions ſevere griping. Beſides its purgative quality, it is celebrated as an aſtringent, by which it ſtrengthens the tone of the ſtomach and inteſtines, and proves uſeful in diarrhœa and diſorders proceeding from laxity.

Rhubarb is exhibited,

1. In ſubſtance, in the form of powder. It operates more powerfully as a purgative in this form than in any other. The doſe for an adult is about a ſcruple or upwards. On account of its great bulk, it is ſometimes unpleaſant to take, and its laxative effects are often increaſed by the addition of neutral ſalts, or other more active purgatives. In ſmaller doſes it often proves an excellent ſtomachic.

2. In infuſion. Rhubarb yields more of its purgative property to water than to alcohol. The infuſion is, however, conſiderably weaker than the powder, and requires double the doſe to produce the ſame effect. It is well adapted for children, but muſt be always freſh prepared.

3. In tincture. On account of the ſtimulating nature of the menſtruum, this preparation frequently cannot be exhibited in doſes large enough to operate as a purgative. Its principal uſe is as a tonic and ſtomachic.

The virtues of rhubarb are deſtroyed by roaſting, boiling, and in forming the extract.

Off. prep.—Inf. *Ed.* Vin. *Ed. Lond.* Tinct. *Ed. Lond.* Tinct. comp. *Lond.* Tinct. cum aloe, *Ed.* Tinct. cum gentian, *Ed.* Pil. comp. *Ed.*

RHODODENDRON CHRYSANTHUM. *Folia.* (*Ed.*)
Yellow-flowered rhododendron. The leaves.

Willd. g. 867. *ſp.* 7. *Decandria Monogynia.*—Nat. ord. *Bicornes.*

THIS ſmall ſhrub grows in the coldeſt ſituations, and higheſt parts of the ſnow-covered mountains in Eaſt Siberia, and eſpecially in Dauria. The leaves are oblong, rigid, reflected at the edges, rough on the upper ſurface, ſmooth, and paler on the lower. When dried, they have no ſmell, but a rough, aſtringent, and bitteriſh taſte. They alſo contain a ſtimulant narcotic principle; for they increaſe the heat of the body, excite thirſt, and produce diaphoreſis, or an increaſed diſcharge of the other ſecretions or excretions; and in a larger doſe, inebriation and delirium.

Medical uſe.—The Siberians uſe a decoction of it in rheumatiſm and gout. They put about two drachms of the dried ſhrub in an earthen pot, with about ten ounces of boiling water, keeping it near a boiling heat for a night, and this they take in the morning. Beſides its other effects, it is ſaid to produce a ſenſation of prickling or creeping in the pained parts; but in a few hours the pain and diſagreeable ſymptoms are relieved, and two or three doſes generally complete the cure. The uſe of liquids is not allowed during its operation, as this is apt to induce vomiting.

RHUS TOXICODENDRON. *Folia.* (*Ed.*)

Poiſon oak. The leaves.

Willd. g. 566. *ſp.* 17. *Pentandria Trigynia.*—Nat. ord. *Dumoſæ.*

THIS is a deciduous ſhrub of moderate growth, a native of North America. The leaves are alternate, and ſtand upon very long leaf-ſtalks. Each leaf conſiſts of three leafits. It is ſaid that its juice is ſo extremely acrid as to cauſe inflammation, and ſometimes even ſphacelation, in the parts touched with it.

Medical uſe.—It was firſt tried as a medicine by Dr. Alderſon of Hull, in imitation of the experiments of M. Freſnoi with the rhus radicans. He gave it in four caſes of paralyſis, in doſes of half a grain, or a grain, three times a-day, and all his patients recovered, to a certain degree, the uſe of their limbs. The firſt ſymptom of amendment was always an unpleaſant feeling of prickling or twitching in the paralytic limbs. We have given it in larger doſes, without experiencing the ſame ſucceſs. It was not, however, inactive. In one caſe the patient diſcontinued its uſe on account of the diſagreeable prickling it occaſioned; and in general it operated as a gentle laxative, notwithſtanding the torpid ſtate of the bowels of ſuch patients.

RIBES.

Willd. g. 445. *Pentandria Monogynia.*—Nat. ord. *Pomaceæ.*

Sp. 1. Ribes Rubrum. *Fructus.* (*Lond. Dub.*)
Red currant. The fruit.

This ſhrub grows wild in England, and is very generally cultivated for the ſake of its pleaſant ſub-acid fruit. The juice of the fruit contains ſaccharine matter, malic, and citric acids, and a ſubſtance ſcarcely ſoluble in cold water, very ſoluble in hot water, and coagulating into the form of a jelly as it cools. By boiling currant juice with a ſufficient quantity of ſugar to abſorb the acid watery parts, the whole forms, on cooling, an uniform jelly, which is often uſed as an acid demulcent in ſore throats, and, diſſolved in water, forms a pleaſant cooling drink in feveriſh complaints.

Sp. 8. Ribes Nigrum. *Fructus.* (*Lond. Dub.*)
Black currant. The fruit.

This is alſo a native ſhrub, which is likewiſe frequently cultivated for the ſame purpoſes with the former variety, and indeed is preferred to it for medical uſe.

Off. prep.—Syr. ſucci fructus rib. nig. *Lond.* Succus ſpiſſat. *Lond.*

RICINUS COMMUNIS. *Semen, et ejus oleum fixum.* (*Ed.*) *Seminis oleum.* (*Lond.*) *Oleum è ſeminibus expreſſum.* (*Dub.*)
Monoecia Monadelphia.—Nat. ord. *Triccocæ.*
Palma Chriſti. The ſeeds, and the fixed oil obtained from them.

This plant grows in both Indies, Africa, and the ſouth of Europe. It is of ſpeedy growth, and in one year arrives at its full height, which ſeldom exceeds twenty feet. The capſules are prickly and triangular, and contain, under a thin, dry, grey, and black-marbled huſk, a white oily kernel. The ſkin is extremely acrid; and one or two of the ſeeds ſwallowed entire operate as a draſtic purgative or emetic.

The kernels yield almoſt a fourth part of their weight of a bland fixed oil, commonly called Caſtor oil. It is obtained from them either by expreſſion or by decoction with water. The former method is practiſed in Europe, the latter in Jamaica. To increaſe the product, it is common to parch the ſeeds over the fire, before the oil is extracted from them; but the oil thus obtained is inferior to that prepared by cold expreſſion or ſimple decoction, and is apt to become rancid.

Off. prep.—Oleum fixum. *Lond.*

Genuine caſtor oil is thick and viſcid, of a whitiſh colour, inſipid or ſweetiſh to the taſte, and without ſmell.

Medical uſe.—As a medicine, it is a gentle and uſeful purgative: it in general produces its effects without griping, and may be given with ſafety where acrid purgatives are improper, as in colic, calculus, gonorrhea, &c.: ſome likewiſe uſe it as a purgative in worm caſes. Half an ounce or an ounce commonly anſwers with an adult, and a drachm or two with an infant.

With many the averſion to oil is ſo great, that this purgative cannot be taken without great reluctance; and accordingly different modes of taking it have been propoſed. Some prefer taking it ſwimming on a glaſs of water, or peppermint water, or in the form of emulſion, with mucilage, or with the addition of a little rum.

ROSA.

Willd. g. 997. *Icoſandria Polygynia.*—Nat. ord. *Senticoſæ.*

Sp. 16. ROSA GALLICA. *Petala.* (*Ed.*) *Roſa rubra. Petala.* (*Lond. Dub.*)

Red roſe. The petals.

THIS has not the fragrance of the ſucceeding ſpecies; but the beautiful colour of its petals, and their pleaſant aſtringency, have rendered them officinal. It muſt, however, be remarked that their odour is increaſed by drying, while that of the damaſk and moſs roſes is almoſt deſtroyed.

Off. prep.—Syr. roſæ Gallicæ, *Ed.* Mel. roſæ, *Lond. Dub.* Infuſ. *Ed. Lond. Dub.* Conſerva, *Ed. Lond. Dub.*

Sp. 17. ROSA DAMASCENA. *Petala.* (*Lond. Dub.*) *Roſa centifolia. Petala.* (*Ed.*)

Damaſk roſe. The petals.

THE native country of this ſhrub is unknown, but the delightful fragrance of its flowers has rendered it the favourite ornament of every garden. In the former editions of Linnæus, the damaſk roſe was conſidered as a variety only of the roſa centifolia; but Aiton, Du Roy, and Willdenow have arranged it as a diſtinct ſpecies. It is however highly probable, that the petals of all the varieties of the roſa centifolia, or Dutch hundred-leaved roſe, Willdenow's 15th ſpecies, are employed indiſcriminately with thoſe of the real damaſk roſe in the diſtillation of roſe water.

Off. prep.—Syr. roſæ centifoliæ, *Ed. Lond.* Aq. deſtil. *Ed. Lond. Dub.*

Sp. 31. ROSA CANINA. *Fructus recens.* (*Ed.*) *Cynoſbatus. Fructus.* (*Lond.*)

Dog roſe. The fruit called Hips.

THIS ſhrub is found in hedges throughout Britain. The pulp of the fruit, beſides ſaccharine matter, contains citric acid, which gives it an acid taſte. The ſeeds, and ſtiff hair with which they are ſurrounded, muſt be carefully removed from the pulp before it can be uſed.

Off. prep.—Conſerva, *Ed. Lond.*

ROSMARINUS OFFICINALIS. *Summitates florentes.* (*Ed.*) *Ros marinus. Cacumen, flos.* (*Lond.*) *Roſmarinus. Herba.* (*Dub.*)

Roſemary. The herb and flowers.

Willd. g. 62. *ſp.* 1. *Diandria Monogynia.*—Nat. ord. *Verticillatæ.*

Rosemary is a ſhrubby perennial, which grows wild in the ſouth of Europe, and is cultivated in our gardens. It has a fragrant ſmell, and a warm pungent bitteriſh taſte, approaching to thoſe of lavendar: the leaves and tender tops are ſtrongeſt; next to theſe the cup of the flower; the flowers themſelves are conſiderably the weakeſt, but moſt pleaſant.

Medical uſe.—Its virtues depend entirely on its eſſential oil, which ſeems to be combined with camphor, not only from its peculiar taſte, but from its poſſeſſing chemical properties, which depend on the preſence of camphor; and from its depoſiting cryſtals of camphor when long kept.

Off. prep.—Ol. vol. *Ed. Lond. Dub.* Spiritus, *Ed. Lond.*

RUBIA TINCTORUM. *Radix.* (*Ed.*) *Rubia. Radix.* (*Lond. Dub.*)

Madder. The root.

Willd. g. 187. *ſp.* 1. *Tetrandria Monogynia.*—Nat. ord. *Stellatæ.*

Madder is perennial, and grows wild in ſome parts of Britain, but the dyers are principally ſupplied with it from Zealand, where it is cultivated in large quantities.

The roots conſiſt of articulated fibres, about the thickneſs of a quill, which are red throughout, have a weak ſmell, and a bitteriſh aſtringent taſte. For the uſe of the dyers, they are firſt peeled and dried, then bruiſed and packed in barrels. Madder poſſeſſes the remarkable property of tinging the urine, milk, and bones, of animals which are fed with it, of a red colour.

Medical uſe.—It is ſaid to be uſeful in the atrophy of children, and ſome believe in its reputed powers as an emmenagogue.

It is given in ſubſtance in doſes of half a drachm, ſeveral times a-day, or in decoction.

RUBUS IDÆUS. *Fructus.* (*Lond. Dub.*)

Raſpberry. The fruit.

Willd. g. 998. *ſp.* 4. *Icoſandria Polygynia.*—Nat. ord. *Senticoſæ.*

This ſhrub is found wild in Britain, and is much cultivated for the ſake of its pleaſant ſub-acid fruit, which contains both citric and malic acids.

Off. prep.—Syr. ſucci fructus rub. idæi, *Lond.*

RUMEX ACETOSA. *Folia.* (*Ed.*) *Acetoſa pratenſis. Folia.* (*Lond.*) *Acetoſa. Folia.* (*Dub.*)

Sorrel. The leaves.

Willd. g. 699. *ſp.* 31. *Hexandria Trigynia.*—Nat. ord. *Oleraceæ.*

Sorrel is a perennial plant, which grows wild in fields and meadows throughout Britain. The leaves have an aſtringent acid taſte, without any ſmell or particular flavour: their medical effects are, to cool, quench thirſt, and promote the urinary diſcharge: a decoction of them in whey affords an uſeful and agreeable drink in febrile or inflammatory diſorders.

All theſe effects are to be aſcribed entirely to the ſuper-oxalate of potaſs which they contain.

RUTA GRAVEOLENS. *Herba.* (*Ed.*) *Ruta. Herba.* (*Lond.*) *Folia.* (*Dub.*)

Rue. The herb.

Willd. g. 927. *ſp.* 1. *Decandria Monogynia.*—Nat. ord. *Multiſiliquæ.*

This is a ſmall ſhrubby plant, a native of the ſouth of Europe, and cultivated in our gardens.

Rue has a ſtrong ungrateful ſmell, and a bitteriſh penetrating taſte: the leaves, when in full vigour, are extremely acrid, inſomuch as to inflame and bliſter the ſkin, if much handled. Neumann got from 960 grains of the dried leaves 330 alcoholic extract, and afterwards 290 watery; and inverſely, 540 watery and 40 alcoholic. Both primary extracts are bitter and acrid. Rue alſo contains a volatile oil, which congeals readily, and is obtained in greateſt quantity by diſtilling the plant with the ſeeds half ripe.

Medical uſe.—With regard to their medical virtues, like other remedies, of which the active conſtituent is an eſſential oil, they are heating and ſtimulating, and hence ſometimes are ſerviceable in ſpaſmodic affections, and caſes of obſtructed ſecretions.

Off. prep.—Ol. volat. *Dub.* Extract, *Ed. Lond. Dub.* Pulv. myrrh. comp. *Lond.*

SACCHARUM OFFICINARUM.

a. *Saccharum non purificatum.* (*Lond. Ed.*) *Saccharum rubrum.* (*Dub.*)
b. *Saccharum purificatum.* (*Lond. Dub.*) *Saccharum puriſſimum.* (*Ed.*)
c. *Sacchari rubri ſyrupus.* (*Dub.*)

Sugar-cane. Raw or brown ſugar. Double refined ſugar. Molaſſes.

Willd. g. 122. *ſp.* 4. *Triandria Digynia.*—Nat. ord. *Gramina.*

The ſugar cane grows wild in both Indies, and forms the principal object of cultivation in the Weſt Indies.

Sugar, of which we have already noticed the general properties, is principally obtained from this plant, by boiling down its expreſſed juice, with the addition of a certain proportion of lime or potaſs, until the greater part is diſpoſed to concrete into browniſh or yellowiſh cryſtalline grains. The lime or potaſs is added to ſaturate ſome malic acid, whoſe preſence impedes the cryſtallization. The *molaſſes*, or that portion of the inſpiſſated juice which does not cryſtallize, is ſeparated from the *raw ſugar*, which is ſent to Europe to be refined. This is performed by diſſolving it in water, boiling the ſolution with lime-water, clarifying it with blood or white of eggs, and ſtraining it through woollen bags. The ſolution, after due evaporation, is permitted to cool to a certain degree, and then poured into conical forms of unglazed earthen ware, where it concretes into a maſs of irregular cryſtals. The ſyrup which has not cryſtallized is then permitted to run off through a hole in the apex of the cone. The upper or broad end of the cone is then covered with moiſt clay, the water of which gradually penetrates into the ſugar, and diſplaces a quantity of ſyrup, which would otherwiſe be retained in it, and diſcolour it. It is then carefully dried, and gets the name of *loaf* or *lump ſugar*. When the ſolution and other ſteps of the proceſs are repeated, the ſugar is ſaid to be *double refined*. Sugar is ſometimes made to aſſume a more regular form of cryſtallization, by carrying the evaporation only a certain length, and then permitting the ſyrup to cool ſlowly. In this form it is called *Brown or White ſugar candy*, according to the degree of its purity.

Raw ſugar varies very much in quality. It ſhould be dry, cryſtallized in large ſparkling grains, of a whitiſh or clear yellow colour, without ſmell, and of a ſweet taſte, without any peculiar flavour.

Refined ſugar ſhould have a brilliant white colour, and a cloſe compact *texture*. It ſhould be very hard, but brittle, and break with ſharp, ſemi-tranſparent, ſplintery fragments.

Medical uſe.—Sugar, from being a luxury, has now become one of the neceſſaries of life. In Europe ſugar is almoſt ſolely uſed as a condiment. But it is alſo a very wholeſome and powerful article of nouriſhment; for during crop time, the negroes in the Weſt-Indies, notwithſtanding their increaſed labours, always grow fat. It is in this way alſo that its internal employment is uſeful in ſome diſeaſes, as in ſea ſcurvy; for ſugar produces no particular effect as a medicine, except that the coarſer and impure kinds are ſlightly purgative. Applied externally it acts as an eſcharotic in ſpongy and unhealthy granulations; and to abraded or inflamed ſurfaces it proves gently ſtimulant. In pharmacy it is principally employed to cover bad taſtes, to give form, and to preſerve more active ſubſtances. In uſing it for the laſt purpoſe, we muſt always remember, that if the proportion of ſugar employed be too ſmall, it will promote inſtead of retarding the fermentation of the articles it is intended to preſerve.

Off. prep.—Syrupi omnes ſuccus ſpiſſat. ſamb. nigri, *Ed.* Miſtura moſchata, *Lond.* Potio carbonat. calcis, *Ed. Lond. Dub.*

Molaſſes or treacle is a very impure ſyrup. It is thick, viſcid, of a dark brown, almoſt black colour, and has a peculiar ſmell, and a ſweet, ſomewhat empyreumatic taſte. Treacle is applied to many domeſtic and economical purpoſes; and in hoſpital practice may ſuperſede the uſe of ſugar in many inſtances.

Off. prep.—Elect. ſennæ, *Dub.*

SAGAPENUM. *Gummi-reſina.* (*Lond. Dub. Ed.*)

Sagapenum. A gum-reſin.

The plant which furniſhes this ſubſtance is not aſcertained, but is conjectured by Willdenow to be the Ferula Perſica.

Sagapenum is a concrete juice brought from Alexandria, either in diſtinct tears, or agglutinated in large maſſes. It is outwardly of a yellowiſh colour; internally, ſomewhat paler, and clear like horn; it grows ſoft upon being handled, and ſticks to the fingers; its taſte is hot, nauſeous, and bitteriſh, and its ſmell diſagreeable and alliaceous.

Neumann got from 480 grains, 306 alcoholic, and 108 watery, extract, and inverſely 170 watery, and 241 alcoholic, extract. The alcohol diſtilled from it was ſenſibly impregnated with its flavour, and along with the water a conſiderable portion of volatile oil aroſe. It is not fuſible.

Medical uſe.—In medical virtues it holds a kind of middle place between aſſa fœtida and galbanum, and may be employed in the ſame manner, and under ſimilar circumſtances.

Off. prep.—Pil. galb. comp. *Lond.*

SALIX FRAGILIS. *Salix. Cortex.* (*Dub.*)

Crack-willow. The bark.

Dioecia Diandria.—Nat. ord. *Amentaceæ.*

This willow grows wild in England. The bark poſſeſſes a conſiderable degree of bitterneſs and aſtringency. Different ſpecies of willow have at different times been recommended as ſubſtitutes for the Peruvian bark: they are certainly powerful aſtringents, but in point of efficacy in the cure of diſeaſe, they are in no degree to be compared with the Peruvian bark, from which they differ in containing no cinchonin.

SALVIA OFFICINALIS. *Folia.* (*Ed.*) *Salvia. Folium.* (*Lond. Dub.*)

Sage. The leaves.

Willd. g. 63. *ſp.* 7. *Diandria Monogynia.*—Nat. ord. *Verticillatæ.*

Sage is a perennial plant, a native of the ſouth of Europe, and cultivated in our gardens. There are ſeveral varieties of it, differing in ſize, or in the colour of its flower, but their properties are the ſame. They have a peculiar aromatic ſmell, and a warm aromatic taſte, with ſome degree of bitterneſs and aſtringency.

Medical uſe.—In its effects ſage agrees with other aromatics. It is ſtimulant, carminative, and tonic. In cold phlegmatic habits, it excites appetite, and proves ſerviceable in debilities of the nervous ſyſtem. The beſt preparation for theſe purpoſes is an infuſion of the dry leaves, drunk as tea; or a tincture, or extract, made with rectified ſpirit, taken in proper doſes; theſe contain the whole virtues of the ſage; the diſtilled water and eſſential oil, only its warmth and aromatic quality, without any of its roughneſs or bitterneſs. Aqueous infuſions of the leaves, with the addition of a little lemon-juice, prove an uſeful diluting drink in febrile diſorders, being ſufficiently agreeable to the palate.

SAMBUCUS NIGRA. *Flores, Baccæ, Cortex.* (*Ed.*) *Sambucus. Cortex interior, Flos, Bacca.* (*Lond. Dub.*)

Common elder. The inner bark, flowers, and berries.

Willd. g. 569. *ſp.* 3. *Pentandria Trigynia.*—Nat. ord. *Dumoſæ.*

This tree is frequent in hedges; it flowers in May, and ripens its fruit in September. The berries contain malic acid, and have a ſweetiſh, not unpleaſant, taſte; nevertheleſs, eaten in ſubſtance, they offend the ſtomach. For the market they are gathered indiſcriminately from the Sambucus nigra and ebulus, a very venial fraud, as their effects are exactly the ſame. They are, however, eaſily diſtinguiſhed, by the latter, when bruiſed, ſtaining the fingers of a red colour, and the former of the colour of a withered leaf.

Med. uſe.—The expreſſed juice, inſpiſſated to the conſiſtence of a rob, proves an uſeful aperient medicine; it opens obſtructions of the viſcera, promotes the natural evacuations, and, if continued for a length of time, does conſiderable ſervice in various chronical diſorders. The inner green bark of its trunk is gently cathartic. An infuſion of it in wine, or the expreſſed juice, in the doſe of half an ounce or an ounce, is ſaid to purge moderately, and in ſmall doſes to prove an efficacious deobſtruent, capable of promoting all the fluid ſecretions. The young leaf buds are ſtrongly purgative, and act with ſo much violence as to be deſervedly accounted unſafe. The flowers are very different in quality: theſe have an agreeable aromatic flavour, which they yield in diſtillation with water, and impart by infuſion to vinous and ſpiritous liquors.

Off. prep.—Succus ſpiſſat. *Lond. Ed.* Ungt. ſambuci, *Lond. Dub.*

SAPO. *Sapo ex oleo olivarum et ſoda confectus.* (*Ed.*) *Sapo ex oleo olivæ et natro confectus.* (*Lond.*) *Sapo durus Hiſpanicus.* (*Dub.*)

The general chemical properties of ſoap have been already noticed. The only ſpecies which is officinal in our pharmacopœias, is that compoſed of olive oil and ſoda. It is only prepared in the countries which produce the oil. For medicinal uſe we prefer the Spaniſh.

It ſhould be white and hard, diſſolve entirely in water and in alcohol, forming with the former a milky, and with the latter a tranſparent ſolution: the ſolutions ſhould froth freely on agitation. It ſhould not be variegated in its colour, feel greaſy or moiſt, or be covered with a ſaline efflorescence; and the ſolutions ſhould not have a rancid ſmell or taſte. Some of the foreign diſpenſatories are ſo very particular about the nature of the ſoap uſed in medicine, as to direct it to be prepared by the apothecary, by ſimply triturating, without the aſſiſtance of heat, Provence oil, with half its weight of a ſolution of ſoda, of the ſpecific gravity of 1.375, until they unite.

Soap is decompoſed by all the acids, earths, and earthy and metalline ſalts. The acids combine with the alkali, and ſeparate the oil. The earths form an inſoluble earthy ſoap with the oil, and ſeparate the alkali; while with the ſalts there is a mutual decompoſition, their acid combines with the alkali, and earthy or metalline ſoaps are formed.

Med. uſe.—The detergent property of ſoap, or the power it poſſeſſes of rendering oily and reſinous ſubſtances miſcible with water, has given riſe to very erroneous notions of its medical virtues. It was ſuppoſed to render ſuch ſubſtances more readily ſoluble in the juices of the ſtomach, and in the fluids of the body, and to be well fitted for diſſolving ſuch oily or unctuous matters as it may meet with in the body, attenuating viſcid juices, opening obſtructions of the viſcera, and deterging all the veſſels it paſſes through. It has likewiſe been ſuppoſed a powerful menſtruum for the urinary calculus; and a ſolution of ſoap in lime-water, has been conſidered as one of the ſtrongeſt diſſolvents that can be taken with ſafety into the ſtomach; for the virtue of this compoſition has been thought conſiderably greater than the aggregate of the diſſolving powers of the ſoap and lime-water when unmixed.

How erroneous theſe ideas are, appears evidently, when we recollect the very eaſy decompoſition of ſoap, which renders it perfectly impoſſible that it ſhould enter the circulating ſyſtem, or indeed come into contact with the fluids even of the mouth, without being decompoſed. As to the ſolution of ſoap in lime-water, we may obſerve, that it is only a clumſy way of exhibiting a ſolution of ſoda; for the ſoap is decompoſed, an inſoluble ſoap of lime is formed, and the ſoda remains in ſolution. The internal uſe of ſoap ſhould therefore be confined, in our opinion, to the giving form to other ſubſtances which are not decompoſed by it, and to decompoſe metallic poiſons when they have been taken into the ſtomach. For this laſt purpoſe, a tea cupful of a ſolution of ſoap, in four times its weight of water, may be drunk every three or four minutes, until a ſufficient quantity be taken.

Applied externally, it is a very powerful detergent, and combines the ſtimulating properties of the alkali with the lubricitating nature of the oil. In this way it often proves a powerful diſcutient, and a uſeful application to ſprains and bruiſes.

Off. prep.—Tinct. *Ed.* Tinct. cum opio, *Ed.* Linim ſap. *Lond. Dub.* Sp. am. ſuccin. *Lond.* Pil aloet, *Ed.* Pil aloes cum aſſa fœtid. *Ed.* Pil ſcill. *Lond. Dub.* Pil ſtib. comp. *Dub.* Cerat ſaponis, *Lond. Dub.* Emp. ſap. *Lond. Dub. Ed.*

SCILLA MARITIMA. *Radix.* (*Ed.*) *Scilla. Radix.* (*Lond. Dub.*)

Squill. The root.

Willd. g. 640. *ſp.* 1. *Hexandria Monogynia.*—Nat. ord. *Liliaceæ.*

The ſquill is a perennial bulbous-rooted plant, which grows wild on the ſandy ſhores of Spain, Portugal, north of Africa, and the Levant.

The root is about the ſize of the fiſt, pear-ſhaped, with the apex upwards, and conſiſts of fleſhy ſcales, attenuated at both edges, ſurrounded by other ſcales, which are arid, ſhining, and ſo thin that the root at firſt ſight ſeems to be tunicated. The recent roots are full of a white viſcid juice, have ſcarcely any ſmell, but a very bitter, nauſeous, and extremely acrid, taſte. Rubbed on the ſkin, it inflames and bliſters.

It is more commonly met with in the ſhops, in the form of the dried ſcales, which ſhould be brittle, ſemipellucid, ſmooth, but marked with lines, and when chewed, ſhould feel tenacious, and taſte very bitter, without manifeſt acrimony.

The active conſtituent of the ſquill is the acrid principle; and, therefore, it becomes almoſt inert by too much drying, or by being kept too long in the form of powder. It alſo contains bitter extractive, much mucilage, albumen, and ſtarch.

Medical uſe.—Given internally in large doſes, it produces purging and vomiting, ſometimes even ſtrangury, bloody urine, inflammation, and eroſion of the ſtomach. In ſmaller doſes it proves a uſeful expectorant and diuretic, and it is ſaid to leſſen the frequency of the pulſe.

Squill is ſometimes given as a general ſtimulant in typhus, eſpecially to cattle. But it is much more frequently exhibited as an expectorant where the lungs are loaded with viſcid matter, and as a diuretic in dropſical caſes, for which purpoſe it is commonly conjoined with calomel.

The doſe of ſquill is one or two grains three or four times a-day; and the moſt commodious form for the taking of ſquills, unleſs when deſigned as an emetic, is that of a bolus, or pill: liquid forms are to moſt people too offenſive, though theſe may be rendered leſs diſagreeable both to the palate and ſtomach by the addition of aromatic diſtilled waters.

Off. prep.—Syrupus ſcillæ maritimæ, *Ed.* Mel. ſcillæ, *Lond. Dub.* Oxymel ſcillæ, *Lond.* Scill. mar. exſiccat, *Ed. Lond. Dub.* Acet. ſcillæ, *Lond. Dub.* Conſerva, *Lond.* Tinctura, *Lond. Dub.* Pil, *Ed. Lond. Dub.*

SINAPIS.

Willd. g. 1246. *Tetradynamia Siliquoſa.*—Nat. ord. *Siliquoſæ.*

Sp. 4. Sinapis Alba. *Semen.* (*Ed.*) *Sinapis. Semina.* (*Dub.*)
White muſtard. The ſeeds.

Sp. 5. Sinapis Nigra. *Sinapis. Semen.* (*Lond.*)
Common muſtard. The ſeeds.

These plants are both annual, both grow wild in England, and poſſeſs ſimilar virtues.

They produce ſmall round compreſſed ſeeds, which have an acrid bitteriſh taſte, and a pungent ſmell when reduced to powder. The common muſtard has blackiſh ſeeds, and is more pungent than the white.

They impart their taſte and ſmell in perfection to aqueous liquors, whilſt rectified ſpirit extracts extremely little of either: the whole of the pungency ariſes with water in diſtillation. Committed to the preſs, they yield a conſiderable quantity of a ſoft inſipid oil, perfectly void of acrimony: the cake left after the expreſſion, is more pungent than the muſtard itſelf.

Medical uſe.—Muſtard-ſeed is ſwallowed entire, to the quantity of a table ſpoonful or more, to ſtimulate the ſtomach in ſome caſes of dyſpepſia, and to excite the periſtaltic motion of the inteſtines, eſpecially when they are torpid, as in paralyſis. The powder made into a paſte with water, is commonly uſed as a condiment with animal food; infuſed in water, it proves emetic when taken in conſiderable doſes, and in ſmaller ones, acts as a diuretic and aperient; but it is more frequently applied externally as a topical ſtimulus, made into a paſte or ſinapiſm with vinegar and bread-crumb.

Off. prep.—Oleum fixum, *Lond. Dub.* Cataplaſma, *Lond. Dub.* Emp. mel. veſic. comp. *Ed.*

SIUM NODIFLORUM. *Sium. Herba.* (*Lond.*)

Creeping ſkerrit. The herb.

Willd. g. 544. *ſp.* 4. *Pentandria Digynia.*—Nat. ord. *Umbellatæ.*

THIS plant is perennial, and grows wild in rivers and ditches in England. It was formerly alleged to be not only a diuretic, but alſo an emmenagogue and lithontriptic. With theſe intentions, however, it is not now employed. Dr. Withering mentions, that a young lady of ſix years old was cured of an obſtinate cutaneous diſeaſe by taking three large ſpoonfuls of the juice twice a-day; and he adds, that he has given repeatedly to adults three or four ounces every morning, in ſimilar complaints. In ſuch doſes it neither affects the head, ſtomach, nor bowels. Children take it readily when mixed with milk.

SISYMBRIUM NASTURTIUM. *Herba.* (*Ed.*) *Naſturtium aquaticum. Herba recens.* (*Lond.*) *Herba.* (*Dub.*)

Common water-creſſes. The recent herb.

Willd. g. 1238. *ſp.* 1. *Tetradynamia Siliquoſa.*—Nat. ord. *Siliquoſæ.*

THIS plant is perennial, and grows wild in clear ſprings and rivulets throughout Britain. Its leaves remain green all the year, but are in greateſt perfection in the ſpring. They have a quick pungent ſmell (when rubbed betwixt the fingers), and an acrid taſte, ſimilar to that of ſcurvy-graſs, but weaker. By drying or boiling, it loſes its ſenſible qualities entirely.

Medical uſe.—It acts as a gentle ſtimulant and diuretic: for theſe purpoſes, the expreſſed juice, which contains the peculiar taſte and pungency of the herb, may be taken in doſes of an ounce or two, and continued for a conſiderable time.

SMILAX SARSAPARILLA. *Radix.* (*Ed.*) *Sarſaparilla. Radix.* (*Lond. Dub.*)

Sarſaparilla. The root.

Diœcia Hexandria.—Nat. ord. *Sarmentaceæ.*

THIS root is brought from the Spaniſh Weſt-Indies. It conſiſts of a great number of long ſtrings hanging from one head: the long roots, the only part made uſe of, are of a blackiſh colour on the outſide, and white within, about the thickneſs of a gooſe-quill, or thicker, flexible, compoſed of a very ſmall woody heart, ſurrounded with fibres running their whole length, which renders them extremely apt to ſplit. They have a glutinous, bitteriſh, not ungrateful taſte, and no ſmell. Inferior kinds of this root are alſo ſold. They are in general thicker, of a paler colour on the outſide, and leſs white within, with a much thicker woody heart. Neumann got from 960 grains, 360 watery, and 10 alcoholic, extract, and inverſely 240 alcoholic, and 120 watery.

Medical uſe.—It was firſt brought into Europe by the Spaniards, about the year 1563, with the character of being a ſpecific for the cure of the lues venerea, a diſeaſe which made its appearance a little before that time, and likewiſe of ſeveral obſtinate chronic diſorders. It is, however, a very inert mucilaginous ſubſtance; and the diaphoreſis, which it is ſometimes ſuppoſed to produce, is entirely owing to the warm and diluent regimen employed at the ſame time.

Off. prep.—Decoct. *Ed. Lond. Dub.*

SOLANUM DULCAMARA. *Dulcamara. Stipites.* (*Dub.*)

Bitter-ſweet. The twigs.

Willd. g. 383. *ſp.* 15. *Pentandria Monogynia.*—Nat. ord. *Solanaceæ.*

THIS plant grows wild in moiſt hedges, has woody brittle ſtalks, and climbs on the buſhes. The taſte of the twigs and roots, as the name of the plant expreſſes, is both bitter and ſweet; the bitterneſs being firſt perceived, and the ſweetneſs afterwards.

Medical uſe.—The dulcamara was formerly much eſteemed as a powerful medicine. It is in general ſaid to occaſion ſome conſiderable evacuation by ſweat, urine, or ſtool, particularly the latter. It has been recommended as a diſcutient and reſolvent medicine; and it has been ſaid to be attended with good effects in obſtinate cutaneous diſeaſes of the herpetic kind. It has alſo been uſed, and ſometimes with advantage, in caſes of rheumatiſm, jaundice, and obſtructed menſtruation. It has principally been employed under the form of watery infuſion, ſometimes under that of extract.

SOLIDAGO VIRGA AUREA. *Virga aurea. Flores. Folia.* (*Dub.*)

Golden-rod. The flowers and leaves.

Syngeneſia Superflua.—Nat. ord. *Compoſitæ radiatæ.*

THIS plant is perennial, and is found wild on heaths and in woods, producing ſpikes of yellow flowers in Auguſt. The leaves have a moderately aſtringent bitter taſte; and hence prove ſerviceable in debility and laxity of the viſcera, and diſorders proceeding from that cauſe.

SPARTIUM SCOPARIUM. *Summitates.* (*Ed.*) *Geniſta. Semina.* (*Dub.*) *Cacumen. Semen.* (*Lond.*)

Common broom. The tops and ſeeds.

Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*

THIS is a very common ſhrub on dry paſtures.

The leaves have a very bitter taſte, and when given in decoctions prove conſiderably diuretic. The ſeeds have ſimilar properties.

Off. prep.—Extract, *Lond.*

SPIGELIA MARILANDICA. *Radix.* (*Ed.*) *Spigelia. Radix.* (*Lond. Dub.*)

Carolina pink. The root.

Willd. g. 308. *ſp.* 2. *Pentandria Monogynia.*—Nat. ord. *Stellatæ.*

THIS plant is perennial, and grows wild in the ſouthern parts of North America. The roots are celebrated as an anthelmintic, particularly for the expulſion of lumbrici from the alimentary canal. Some order it in doſes of ten or fifteen grains; and allege it is apt to occaſion nervous affections if given in large doſes; while others order it in drachm doſes, alleging that the bad effects mentioned more readily happen from ſmall doſes, as the large ones often purge or puke; ſome prefer the form of infuſion. An emetic is generally premiſed; and its purgative effect aſſiſted by ſome ſuitable additions.

SPONGIA OFFICINALIS. (*Ed.*) *Spongia.* (*Lond. Dub.*)

Sponge.

Cl. *Zoophyta.* Ord. *Spongia.*

SPONGE is principally found in the Mediterranean and Red ſeas. It was long ſuppoſed to be a vegetable production, but it is now univerſally allowed to belong to that remarkable claſs of animals called Zoophytes, which are negatively characterized by Cuvier, as having no vertebræ, no ſanguiferous veſſels, no ſpinal marrow, and no articulated limbs. The ſponges belong to that diviſion of the zoophytes, which are attached to a ſolid trunk, and are particularized by their baſe being ſpongy, friable, or fibrous.

Sponge is a ſoft, light, very porous and compreſſible ſubſtance.

Med. uſe.—It adheres ſtrongly to the mouths of wounded veſſels; and when retained by proper compreſſion, it is preferable to agaric or puff-ball, for ſtopping hæmorrhagies.

From its property of imbibing and diſtending by moiſture it is ſometimes made uſe of as a tent for dilating wounds and ulcers. To fit it for theſe intentions, the ſponge is immerſed in melted wax, and ſubjected to preſſure till cool. In this ſtate it may be eaſily formed into proper tents, ſo as to be introduced where neceſſary. And from the gradual melting of the wax in conſequence of the heat of the part, a dilatation of courſe takes place.

Burnt ſponge is nothing elſe than charcoal mixed with a little muriate of ſoda and phoſphate of lime.

Off. prep.—Spongia uſta, *Lond. Dub.*

STALAGMITIS CAMBOGIOIDES. Murray. *Gambogia. Gummi-reſina.* (*Ed. Lond. Dub.*)

The gum-reſin called Gamboge.

Polygamia Monœcia.—Nat. ord. *Tricoccæ.*

The tree which furniſhes the gamboge is of middling ſize, and grows wild in the kingdom of Siam and in Ceylon. In Siam the gum-reſin is obtained in drops by breaking the leaves and young ſhoots; hence probably its name Gummi-guttæ; but in Ceylon it is extracted from the wood of the tree in the form of a juice, which ſoon becomes ſolid. Gamboge, or at leaſt a very ſimilar ſubſtance, is alſo got in the ſame way from different ſpecies of Garcinia, eſpecially the Gambogia, (the Gambogia Gutta of Lin.) *Willd. g.* 938. *ſp.* 3. *Dodecandria Monogynia*, and from different ſpecies of hypericum, eſpecially the bacciferum. It is brought from the Eaſt-Indies in large cakes or rolls. The beſt ſort is of a deep yellow or orange colour, breaks ſhining, and free from impurities. It has no ſmell, and very little taſte, unleſs kept in the mouth for ſome time, when it impreſſes a ſlight ſenſe of acrimony. Neumann got from ſixteen ounces, fourteen of alcoholic extract, and one of watery, and inverſely thirteen of watery, and two of alcoholic. He alſo found it almoſt entirely ſoluble in water, impregnated with a moderate proportion of fixed alkaline ſalt. According to my experiments, which confirm theſe obſervations, the watery ſolution is opaque and yellow. With alcohol it forms a tranſparent ſolution of a bright golden colour; and the reſiduum is totally ſoluble in water. The alcoholic ſolution is decompoſed by water, becoming yellow and opaque; but the precipitate remains long ſuſpended, and cannot be ſeparated by common filtering paper. Gamboge is readily ſoluble in ſolution of potaſs, acquiring a bright red colour the moment it is thrown into it, and forming a dark coloured ſolution, which is not decompoſed by water, but by the addition of any acid immediately produces a copious yellow precipitate, very ſoluble in exceſs of acid. The reſiduum is ſoluble in water. Ammoniated alcohol diſſolves gamboge with ſimilar phenomena. It is alſo very ſoluble, but with decompoſition in acids. The acid ſolution is decompoſed by water.

Medical uſe.—Gamboge evacuates powerfully both upwards and downwards; ſome condemn it as acting with too great violence, and occaſioning dangerous hypercatharſis; while others are of a contrary opinion. Geoffroy ſeems particularly fond of this medicine, and informs us, that he has frequently given from two to four grains, without its proving at all emetic; that from four to eight grains both vomit and purge without violence; that its operation is ſoon over; and that if given in a liquid form, and ſufficiently diluted, it does not need any corrector; that in the form of a bolus or pill, it is moſt apt to prove emetic, but very rarely has this effect if joined along with *Calomel.* He nevertheleſs cautions againſt its uſe where the patients cannot eaſily bear vomiting.

It has been uſed in dropſy with cream of tartar or jalap, or both, to quicken their operation. It is alſo recommended by ſome to the extent of fifteen grains, with an equal quantity of vegetable alkali, in caſes of the tape-worm. This doſe is ordered in the morning; and if the worm is not expelled in two or three hours, it is repeated even to the third time with ſafety and efficacy. It is aſſerted, that it has been given to this extent even in delicate habits.

It is an ingredient, and probably the active one, in moſt of the noſtrums for expelling tæniæ.

STANNUM. (*Lond.*) *Limatura et pulvis.* (*Dub. Ed.*)

The general properties of tin have been already mentioned.

It is found,

1. Sulphuretted, and combined with copper. Tin-pyrites.
2. Oxidized.
   - *a.* Combined with oxide of iron and ſilica. Common tinſtone.
   - *b.* Combined with oxide of iron and a little arſenic. Fibrous tinſtone.

The beſt tin is found in Cornwall, or is brought from the Eaſt-Indies. Its purity is eſtimated by its ſmall ſpecific gravity, and by the crackling noiſe it makes when bent.

It is now only uſed as an anthelmintic, eſpecially in caſes of tænia, and probably acts mechanically.

Off. prep.—Pulvis ſtanni, *Lond. Dub.*

STYRAX.

Willd. g. 874. *Decandria Monogynia.*—Nat. ord. *Bicornes.*

Sp. 1. Styrax Officinale. *Balſamum.* (*Ed.*) *Styrax. Reſina.* (*Lond.*) *Styrax calamita. Reſina.* (*Dub.*)

Storax. A balſam.

This tree grows in the Levant, and in Italy and France. The ſtorax flows from wounds made in the bark, in countries where the heat is ſufficient, for neither in France nor in Italy does it furniſh any.

It is either in ſmall diſtinct tears, of a whitiſh or reddiſh colour, or in large maſſes compoſed of ſuch, or in maſſes of an uniform texture and yellowiſh red or browniſh colour; though ſometimes likewiſe interſperſed with a few whitiſh grains.

The *common ſtorax* of the ſhops is in large maſſes, conſiderably lighter and leſs compact than the foregoing; it appears on examination to be compoſed of a fine reſinous juice, mixed with a quantity of ſaw-duſt.

Storax has an agreeable ſmell, and an aromatic taſte. Neumann got from 480 grains, 360 alcoholic, and 30 of watery, extract, and inverſely 120 watery, and 240 alcoholic. In diſtillation it yielded benzoic acid. It is, therefore, a balſam, or natural combination of reſin with benzoic acid.

Off. prep.—Styrax purif. *Lond. Dub.* Tinct. benz. comp. *Lond. Ed.*

Sp. 3. STYRAX BENZOIN. *Balſamum.* (*Ed.*) *Benzoë. Reſina.* (*Lond.*) *Benzoinum. Reſina.* (*Dub.*)

Benzoin, a balſam.

THIS ſpecies grows in Sumatra, and, like the former, alſo furniſhes a balſam on being wounded.

It is brought from the Eaſt-Indies only; in large maſſes compoſed of white and light brown pieces, or yellowiſh ſpecks, breaking very eaſily betwixt the hands: ſuch as is whitiſh, and free from impurities, is moſt eſteemed.

In its properties it differs from ſtorax, only in containing a larger proportion of benzoic acid. Neumann found that it was totally ſoluble in alcohol, forming a blood-red tincture, and that water extracted no gummy matter, but a notable proportion of benzoic acid. By ſublimation he got two ounces of impure acid from ſixteen of benzoin. Lime and the alkaline carbonates diſſolve the acid without attacking the reſin, and are accordingly employed in the proceſſes of Scheele, Gœttling, and Gren, for obtaining the benzoic acid. I find that the ſolution of potaſs diſſolves benzóin very rapidly, forming a dark coloured ſolution, mixed with fine cryſtals of benzoat of potaſs. This alkaline ſolution is not decompoſed by water, but forms with acids a roſe-coloured coagulum, eaſily ſoluble in exceſs of acid. Boiling nitrous acid alſo attacks benzoin with great violence, the ſolution becomes turbid, and lets fall a copious precipitate on cooling. It is alſo decompoſed by water, and by alkaline ſolutions.

Off. prep.—Acid benzoic, *Ed. Lond. Dub.* Tinct. benz. comp. *Ed. Lond.*

SUB-BORAS SODÆ. *Boras Sodæ.* (*Ed.*) *Borax.* (*Lond. Dub.*)

Sub-borate of ſoda. Borax.

Borax is found only in Thibet and Perſia. It exiſts in the water of ſome wells and lakes, and is extracted from them by evaporation. In its impure ſtate it is called tincal, and is brought from the Eaſt-Indies in great maſſes, compoſed of a few large cryſtals, but chiefly of ſmaller ones, partly white and partly green, joined together as it were by a greaſy yellow ſubſtance, intermixed with ſand, ſmall ſtones, and other impurities. By repeated ſolutions, filtrations, and cryſtallizations, it ſhoots into hexangular priſms of which two ſides are broader than the others, terminated by traingular pyramids, of a white colour, a ſtyptic and alkaline taſte, colouring vegetable blues green, ſoluble in eighteen parts of water at 60°, and in ſix at 212°, ſlightly effloreſcing in the air, and when heated, ſwelling, and, with the loſs of nearly half its weight, forming a porous friable maſs, which, in a greater heat, melts into a tranſparent glaſs ſoluble in water. Beſides the acids and alkalies which have a greater affinity for its acid or baſe than theſe have for each other, it is decompoſed by ſulphates, muriates, nitrates, phoſphates, and fluates, of all the earths and of ammonia. It conſiſts of 39 boracic acid, 17 ſoda, and 44 water.

Medical uſe.—The medical virtues of borax have not been ſufficiently aſcertained by experience: it is ſuppoſed to be, in doſes of half a drachm or two ſcruples, diuretic, emmenagogue, and a promoter of delivery. Mr. Biſſet, in an eſſay on the medical conſtitution of Great Britain, recommends a ſolution of this ſalt in water, as the moſt powerful diſſolvent yet known, of aphthous cruſts in the mouth and fauces of children. And for the ſame purpoſe alſo, a ſmall quantity of it is often applied in the form of powder mixed up with ſugar. There are ſtrong reaſons to believe, that the virtues of borax are much greater than they are in general ſuppoſed to be; and that it may be more extenſively uſed with advantage.

SUCCINUM. (*Ed. Lond. Dub.*)

Amber.

This is a ſolid, brittle, bituminous, ſubſtance, dug out of the earth, or found upon the ſea-ſhores; the largeſt quantities are met with along the coaſts of Poliſh Pruſſia and Pomerania. It is of a white yellow, or brown colour, ſometimes opaque, and ſometimes very clear and tranſparent.

It emits an agreeable ſmell when heated or rubbed. By friction it becomes electric; and when heated it ſoftens, ſwells, and then melts and burns with a greeniſh or bluiſh flame, leaving a coaly reſiduum. By diſtillation it affords a little acetous acid, an eſſential oil, and a peculiar acid, named from it the Succinic. It is not acted upon by water, or diluted acids. It is imperfectly diſſolved in alcohol and ether. Hoffmann diſſolved it in oil of almonds in Papin's digeſter, and in a boiling ſolution of potaſs. Dr. Thomſon lately diſcovered that it was ſoluble in the cold, even in a very weak ſolution of the ſub-carbonate of potaſs. Heyer aſcertained that it was ſoluble with decompoſition in nitrous acid. In attempting to form ſuccinic acid by the action of nitrous acid or amber, I made the ſame obſervation. The acid when heated to ebullition acts violently, copious red fumes are emitted, and the amber is firſt as if melted, and then diſſolved. On cooling, part of the amber ſeparates. The acid ſolution is decompoſed by water, and by alkaline ſolutions. Amber is rendered ſoluble in the fixed and volatile oils by melting or roaſting it.

It is only kept for the empyreumatic oil and acid obtained from it.

Off. prep.—Acid. et ol. ſuccini, *Lond. Ed. Dub.* Succin. ppt. *Lond.*

SULPHAS.

Sulphate is a generic term for the combination of ſulphuric acid with the alkalies, earths, and metallic oxides. Their generic characters have been already noticed. Like the other genera, they may be divided into three families.

Family 1. Alkaline ſulphates.—Theſe form no precipitate with alkaline carbonates.

Family 2. Earthy ſulphates.—Theſe are either inſoluble in water, or, if ſoluble, form a white precipitate with alkaline carbonates.

Family 3. Metalline ſulphates.—Theſe form precipitates, which are often coloured, with alkaline carbonates in general, with pruſſiate of potaſs and iron, and with gallic acid.

SUPER-SULPHAS ALUMINÆ ET POTASSÆ. *Sulphas Aluminæ.* (*Ed.*) *Alumen.* (*Lond. Dub.*)

Super-ſulphate of alumina and potaſs. Alum.

Alum is obtained principally from ſchiſtoſe clays, which contain iron pyrites, by roaſting, expoſure, lixiviation, the addition of a proportion of potaſs ley, evaporation, and cryſtallization.

The roaſting deſtroys the bituminous matters theſe clays commonly contain, the expoſure to the air acidifies the ſulphur of the pyrites, and the addition of alkali is abſolutely neceſſary for the conſtitution of alum, which is a triple ſalt, with exceſs of acid, conſiſting of ſulphuric acid, alumina, and potaſs, or ammonia, or a mixture of both. The properties of alum do not ſeem to be affected by the nature of the alkali. To ſave the trouble of evaporation, M. Curadau has given another method of manufacturing this ſubſtance. He takes 100 parts of clay, and 5 parts of muriate of ſoda, diſſolved in as much water as is neceſſary to form the whole into a paſte, which is made into cakes, and baked for two hours in a reverberatory furnace. The maſs is then reduced to powder, and put into a good caſk; a quarter of its weight of ſulphuric acid is then added to it at ſeveral times, ſtirring it well each time. After the vapours of the muriatic acid are diſengaged, an equal quantity of water with the acid is added. The mixture then becomes hot, ſwells, and emits very abundant vapours. When the heat is ſomewhat moderated, more water muſt be added until there is about eight or ten times as much as of the acid. The liquor is then drawn off into leaden veſſels, and an equal quantity of water poured upon the reſiduum, which is alſo drawn off and added to the former. To theſe is laſtly added a ſolution containing as much potaſs as is equal to a fourth part, or ſulphate of potaſs equal to one half the weight of the acid. As the liquor cools, it affords cryſtallized alum, equal in weight to three times the acid, and which may be farther purified by rediſſolving it in the ſmalleſt poſſible quantity of boiling water, and allowing it to cryſtallize.

Alum cryſtallizes in regular octohedrons, whoſe ſides are equilateral triangles. It has a ſweetiſh but very aſtringent taſte. It is ſoluble in 15 times its weight of water at 60°, and in three fourths of its weight at 212°. It reddens vegetable blues. It effloreſces ſlightly in the air. By the action of heat it firſt undergoes the watery fuſion, then loſes its water of cryſtallization, and laſtly great part of its acid. It is decompoſed by baryta, potaſs, ſoda, ſtrontia, and all ſalts of which theſe are the baſes; by the nitrate, muriate, phoſphate, carbonate, borate, and fluate of ammonia; by the nitrate, muriate, phoſphate, and carbonate of magneſia; and by the nitrate, muriate, and carbonate of lime. It is alſo decompoſed by the gallic acid, by colouring matters, and by many animal and vegetable ſubſtances, in a manner not yet ſufficiently underſtood.

It commonly conſiſts, according to Vauquelin, of 49 ſulphate of alumina, 7 ſulphate of potaſs, and 44 of water.

Medical uſe.—Alum is a powerful aſtringent: it is reckoned particularly ſerviceable for reſtraining hæmorrhagies, and immoderate ſecretions from the blood; but leſs proper in inteſtinal fluxes. In violent hæmorrhagies, it may be given in doſes of fifteen or twenty grains, and repeated every hour or half hour till the bleeding abates: in other caſes, ſmaller doſes are more adviſable; large ones being apt to nauſeate the ſtomach, and occaſion violent conſtipations of the bowels. It is uſed alſo externally, in aſtringent and repellent lotions and collyria. Burnt alum taken internally has been highly extolled in caſes of colic. In ſuch inſtances, when taken to the extent of a ſcruple for a doſe, it has been ſaid gently to move the belly, and give very great relief from the ſevere pain

Off. prep.—Alumen purif. *Lond.* Sulph. alum. exſicc. *Ed. Lond. Dub.* Solutio ſulphat. cupri. comp. *Ed.* Aqua alum. comp. *Lond.* Pulv. comp. *Ed.* Cataplaſma, *Lond. Dub.*

SULPHAS BARYTÆ.

Sulphate of baryta. Ponderous ſpar.

THIS ſalt has been omitted in the liſt of the materia medica of the Edinburgh college; for they afterwards employ it for the preparation of the muriate of baryta.

It is found in great abundance in many countries, either in a looſe earthy form, or compact, or foliated, or ſtriated, or acicular. The foliated is in general the pureſt. Its ſpecific gravity is from 4.4 to 4.865. It is inſoluble in water. It is ſoluble in boiling concentrated ſulphuric acid. It decrepitates when ſuddenly heated. By being formed into a thin cake with flour and water, and being afterwards heated to redneſs, it becomes phoſphoreſcent. Heated to redneſs with charcoal, it is converted into a ſulphuret, and it may be decompoſed either by boiling, or in a crucible, with the carbonates of potaſs and of ſoda. It contains about 84 of baryta, and 16 ſulphuric acid and water.

Off. prep.—Murias barytæ, *Ed.*

SULPHAS MAGNESIÆ. (*Ed.*) *Magneſia Vitriolata.* (*Lond. Dub.*)

Sulphate of magneſia. Epſom ſalt.

THIS ſalt is contained in ſeveral mineral ſprings, and alſo in ſea water, from which it is obtained by evaporation. It cryſtallizes in tetrahedral priſms. It has a very bitter taſte. It is ſoluble in its own weight of water at 60°, and three fourths of its weight of boiling water. Sulphate of magneſia when perfectly pure effloreſces, but that of commerce generally contains foreign ſalts, ſuch as the muriate of magneſia, which renders it ſo deliqueſcent that it muſt be kept in a cloſe veſſel or bladder. By the action of heat it undergoes the watery fuſion, and loſes its water of cryſtallization, but does not part with its acid. It is decompoſed by baryta, ſtrontia, the alkalies, and all the ſalts formed by theſe ſalifiable baſes, excepting the alkaline muriates; and by the nitrate, muriate, and carbonate of lime.

Medical uſe.—It is a mild and gentle purgative, operating with ſufficient efficacy, and in general with eaſe and ſafety, rarely occaſioning any gripes, ſickneſs, or the other inconveniences which purgatives of the reſinous kind are too often accompanied with. Six or eight drachms may be diſſolved for a doſe in a proper quantity of common water; or four, five, or more, in a pint, or quart of the purging mineral waters. Theſe liquors may likewiſe be ſo managed as to promote evacuation by the other emunctories: if the patient be kept warm, they increaſe perſpiration; and by moderate exerciſe in the cool air, the urinary diſcharge. Some allege this ſalt has a peculiar effect in allaying pain, as in colic, even independently of evacuation.

It is principally uſed for the preparation of the carbonate of magneſia.

Off. prep.—Carbonas magneſiæ, *Ed.*

SULPHUR SUBLIMATUM. (*Lond. Dub. Ed.*)
Sublimed ſulphur.

THE properties of ſulphur have been already mentioned.

In the neighbourhood of volcanoes it is ſometimes found perfectly pure and cryſtallized; but all the ſulphur of commerce is extracted from pyrites by ſublimation. It is uſually brought to us in large irregular maſſes, which are afterwards melted and caſt into cylindrical rolls, with the addition of ſome coarſe reſin, flour, or the like; whence the paler colour of the rolls.

Sulphur ſhould be choſen of a bright yellow colour, ſhould be very inflammable, and ſhould burn with a bright pure blue flame. Sublimed ſulphur is never prepared by the apothecary. It has the form of a very fine powder, having a beautiful yellow colour. It often is contaminated with a little ſulphuric acid, formed during the proceſs, from which it is eaſily freed by waſhing.

Medical uſe.—Pure ſulphur looſens the belly, and promotes inſenſible perſpiration: it ſeems to paſs through the whole habit, and manifeſtly tranſpires through the pores of the ſkin, as appears from the ſulphureous ſmell of perſons who have taken it, and from ſilver being ſtained in their pockets of a blackiſh colour, which is the known effect of ſulphureous fumes. It is a celebrated remedy againſt cutaneous diſeaſes, both given internally, and externally applied. It has likewiſe been recommended in coughs, aſthmas, and other diſorders of the breaſt and lungs; and particularly in catarrhs of the chronic kind. But it is probable, that the benefit derived from it in theſe caſes, is principally, if not entirely, to be attributed to its operation as a gentle laxative. And with this intention it is frequently uſed with great advantage in hæmorrhoidal affections, and many other diſeaſes in which it is proper to keep the belly gently open.

Off. prep.—Sulph. ſub. lot. *Ed. Lond. Dub.* Sulphas pot. cum ſulph. *Ed.* Sulphur. pot. *Ed. Lond. Dub.* Hydro-ſulph. ammon. *Ed.* Sulph. hyd. nigr. *Ed. Lond. Dub.* Hyd. ſulph. rub. *Lond. Dub.* Oleum ſulph. *Ed. Lond.* Petrol. ſulph. *Lond.* Ungt. ſulph. *Ed. Lond. Dub.*

SUPER-TARTRIS POTASSÆ. (*Ed.*) *Tartari Cryſtalli.* (*Lond.*) *Tartari cryſtalli et cremor dictum.* (*Dub.*)

Super-tartrate of potaſs, cryſtals of tartar, and cream of tartar.

SUPER-TARTRIS POTASSÆ IMPURUS. (*Ed.*) *Tartarum.* (*Lond. Dub.*)

Impure ſuper-tartrate of potaſs. Tartar.

TARTAR exiſts in verjuice and in muſt, and is depoſited on the ſides of the caſks by repoſe, from which it is ſcraped ſome time before the next vintage, to prepare the caſks to receive the new wine. The deepeſt coloured and coarſeſt wines generally give moſt tartar; and it gets the name of white or red tartar according to its colour.

It is purified by diſſolving it in boiling water, and ſeparating the earthy part by filtrating the coiling ſolution. On cooling the ſolution, it depoſites irregular cryſtals, containing the oily and colouring matters, which are ſeparated by boiling the maſs with a white clay. At Venice it is purified by diſſolving it in water, and clarifying it with whites of eggs and aſhes. The tartar thus purified, when cryſtallized, or in powder, is called Cream of Tartar.

Its cryſtals are ſmall and irregular, and do not melt in the mouth, but feel gritty under the teeth. It has an acid harſh taſte. It is ſoluble in ſixty times its weight of water at 60°, and in thirty at 212°. It is decompoſed, and its acid is deſtroyed, by heat. It contains 23 parts of potaſs, according to Bergman, and 33, according to Thenard.

Medical uſe.—The virtues of tartar are thoſe of a mild, cooling, aperient, laxative medicine. It is much uſed in dropſy; and ſome allege that it has good effects as a deobſtruent, in dropſy from ſcirrhus. Taken from half an ounce to an ounce, it proves a gentle, though effectual purgative. Given in ſmaller doſes, and in ſolution, it often acts as a powerful diuretic.

Off. prep.—Tartris potaſſæ, *Ed. Lond. Dub.* Tartris pot. et ſodæ, *Ed. Lond. Dub.* Tartris ant. *Ed. Lond. Dub.* Ferrum tartariſat, *Lond.* Inf. ſennæ tartar. *Lond.* Pulv. jalap. comp. *Ed.* Pulv. ſcam. comp. *Ed.* Pulv. ſennæ comp. *Ed.*

SUS SCROFA. *Adeps.* (*Ed.*) *Sus. Adeps.* (*Lond.*) *Adeps ſuillus.* (*Dub.*)

The hog. The fat. Hogs lard.

Cl. *Mammalia.*—Ord. *Pachyderma.*

IN hogs-lard we have a very pure animal fat, almoſt entirely free from any peculiar impregnation, and of a ſoft conſiſtence. Hence it is a very uſeful emollient for relaxing thoſe parts to which it is applied; and it is alſo a very convenient article for giving the proper conſiſtence to ointments, plaſters, and liniments. Indeed this and the ſevum ovillum, or mutton-ſuet, are the only fats now retained by the London and Edinburgh colleges, although formerly more than twenty different fats entered ſome liſts of materia medica. Each particular fat was then ſuppoſed to poſſeſs peculiar properties; but for this there is probably no foundation: even thoſe retained are now leſs employed than before, as it has been imagined that a proper conſiſtence of any kind may be more certainly obtained by determined proportions of wax and oil; but as theſe articles are more expenſive, hogs-lard and mutton-ſuet are often ſubſtituted for them by the apothecaries.

Off. prep.—Adeps ppt. *Lond.* Ungt. adipis ſuill. *Lond.* Ungt. reſin. *Ed.* Empl. canth. *Lond. Dub.* Ungt. hell. alb. *Dub.* Ungt. ſulph. *Ed.* Ungt. acidi nitroſi, *Ed.* Ungt. hydrarg. *Ed. Lond. Dub.* Ungt. oxidi hydrarg. rubri, *Ed.* Ungt. nitrat. hydrarg. *Ed. Lond. Dub.* Ungt. infuſ. mel. veſic. *Ed.*

SWIETENIA.

Willd. g. 843. *Decandria Monogynia.*—Nat. ord. *Tribilatæ.*

Sp. 1. Swietenia Mahagoni. *Cortex.* (*Ed.*)
Mahogany tree. The bark.

This majeſtic tree grows principally in Jamaica and in Spaniſh America. Its uſeful wood is univerſally known. Its bark is brown, rough, and ſcaly; on the branches grey and ſmoother. Its taſte is very aſtringent, and bitterer than that of Peruvian bark. Its ſmell weak and aromatic. In its properties and action on the living body, it coincides with Peruvian bark, and may be ſubſtituted for it in many ſituations.

Sp. 2. Swietenia Febrifuga. *Cortex.* (*Ed.*)
Febrifuge Swietenia. The bark.

This ſpecies, which in many reſpects reſembles the former, is a native of the Eaſt-Indies. Its bark is red, brittle, and compact, and covered with a rough grey cuticle. In its properties it agrees with the mahogany bark, and forms a very valuable ſubſtitute for Peruvian bark in the Eaſt-Indies, where this laſt is ſo dear and ſcarce, and the diſeaſes in which it is indicated ſo common. It is, however, merely an aſtringent bitter, and contains no cinchonin. Dr. Roxburgh ſent from India a quantity of the extract of this bark, which could not be diſtinguiſhed from the kino of the ſhops.

TAMARINDUS INDICA. *Fructus conditus.* (*Ed.*) *Tamarindus. Fructus.* (*Lond. Dub.*)

Tamarind tree. The preſerved fruit.

Willd. g. 1250. *ſp.* 1. *Monadelphia Triandria.*—Nat. ord. *Lomentaceæ.*

This tree grows both in the Eaſt and Weſt Indies. The fruit is a broad aſh-coloured pod. The external covering is thin and brittle, and contains ſeveral hard ſeeds, enveloped in a ſoft brown pulp. Tamarinds are cured in two ways. The common way is to throw hot ſugar from the boilers on the ripe pulp; but a better method is to put alternate layers of tamarinds and powdered ſugar in a ſtone jar. By this means the tamarinds preſerve their colour, and taſte more agreeably.

Eaſt-India tamarinds are longer than the Weſt-India ſort; the former containing ſix or ſeven ſeeds each, the latter rarely above three or four.

Preſerved tamarinds ſhould be freſh and juicy, and ſhould have an agreeable acid taſte. They ſhould not have a muſty ſmell; the ſeeds ſhould not be ſoft and ſwollen, and the blade of a knife ſhould not get a coating of copper by being immerſed amongſt them.

Tamarinds contain ſugar, mucilage, citric acid, ſuper-tartrite of potaſs, tartarous acid, and malic acid.

Medical uſe.—The pulp of theſe fruits, taken in the quantity of from two or three drachms to an ounce or more, proves gently laxative and purgative; and at the ſame time, by its acidity, quenches thirſt, and allays immoderate heat. It increaſes the action of the purgative ſweets, caſſia and manna, and weakens that of the reſinous cathartics.

Salts, whoſe baſe is potaſs, form an improper addition to tamarind, for they are decompoſed, and the tartarous acid of the fruit is precipitated in the form of ſuper-tartrate of potaſs.

Off. prep.—Inf. cum ſenna, *Ed.* Elect. caſſiæ, *Ed. Lond. Dub.* Elect. ſennæ, *Ed. Lond.*

TANACETUM VULGARE. *Folia, Flores.* (*Ed.*) *Tanacetum. Folia.* (*Dub.*) *Flos, Herba.* (*Lond.*)

Tanſy. The flower and leaves.

Syngeneſia ſuperflua.—Nat. ord. *Compoſitæ diſcoideæ.*

Tansy is perennial, and grows wild by road-ſides and the borders of fields, and is frequently alſo cultivated in gardens, both for culinary and medicinal uſes: it flowers in June and July.

Medical uſe.—Conſidered as a medicine, it is a moderately warm bitter, accompanied with a ſtrong, not very diſagreeable flavour. Some phyſicians have had a great opinion of it in hyſteric diſorders, particularly thoſe proceeding from a deficiency or ſuppreſſion of the uterine purgations. The leaves and ſeeds have been of conſiderable eſteem as anthelmintics; the ſeeds are leſs bitter, and more acrid and aromatic than thoſe of rue, to which they are reckoned ſimilar; or of ſantonicum, for which they have been frequently ſubſtituted. An infuſion of tanſy, drunk in a manner ſimilar to tea, has been ſtrongly recommended as a preventive of the return of gout.

TEUCRIUM.

Willd. g. 1093. *Didynamia Gymnoſpermia.*—Nat. ord. *Verticillatæ.*

Sp. 12. TEUCRIUM MARUM. *Marum Syriacum. Herba.* (*Lond. Dub.*)

Syrian herb maſtich.

THIS is a ſmall ſhrubby plant, growing ſpontaneouſly in Syria, Candy, and other warm climates, and cultivated with us in gardens. The leaves have an aromatic bitteriſh taſte; and, when rubbed betwixt the fingers, a quick pungent ſmell, like volatile alkali, which ſoon affects the head, and occaſions ſneezing: diſtilled with water, they yield a very acrid, penetrating eſſential oil, reſembling that of ſcurvy-graſs. Theſe qualities ſufficiently point out the uſes to which this plant might be applied; at preſent it is little otherwiſe employed than in cephalic ſnuffs.

Off. prep.—Pulv. aſari comp. *Ed. Lond. Dub.*

Sp. 34. TEUCRIUM SCORDIUM. *Scordium. Herba.* (*Lond.*)

Water germander. The herb.

THIS is a ſmall, ſomewhat hairy, perennial plant, growing wild in ſome parts of England, though not very common: the ſhops are generally ſupplied from gardens. It has a bitter taſte, and a ſtrong diſagreeable ſmell.

Off. prep.—Catap. cumini, *Lond.*

TOLUIFERA BALSAMUM. *Balſamum.* (*Ed.*) *Balſamum Tolutanum.* (*Lond. Dub.*)

Balſam of Tolu.

Willd. g. 828. *ſp.* 1. *Decandria Monogynia.*—Nat. ord. *Lomentaceæ.*

THIS tree grows in Spaniſh America, and the balſam flows from inciſions made in its bark, during the hot ſeaſon, and is brought to us in little gourd ſhells. It is of a yellowiſh-brown colour, inclining to red: in conſiſtence thick and tenacious: by age it grows hard and brittle, without ſuffering any great loſs of its more valuable parts. The ſmell of this balſam is extremely fragrant, ſomewhat reſembling that of lemons; its taſte warm and ſweetiſh. Lewis ſays that he has ſometimes procured benzoic acid from it; it yields very little volatile oil, although it impregnates the diſtilled water ſtrongly with its flavour. By diſſolving a proper quantity of ſugar in this water, a ſyrup is obtained, greatly ſuperior to that prepared in the common way, with a decoction of the balſam.

In its medical virtues it agrees with the other balſams.

Off. prep.—Syr. *Lond.* Tinct. *Ed. Lond. Dub.* Tinct. benz. comp. *Lond. Ed.*

TORMENTILLA ERECTA. *Radix.* (*Ed.*) *Tormentilla. Radix.* (*Lond. Dub.*)

Septfoil. The root.

Willd. g. 1001. *ſp.* 1. *Icoſandria Polygynia.*—Nat. ord. *Senticoſæ.*

Tormentil is perennial, and found wild in woods and on commons: it has long ſlender ſtalks, with uſually ſeven long narrow leaves at a joint; the root is for the moſt part crooked and knotty, of a blackiſh colour on the outſide, and a reddiſh within. This root has an auſtere ſtyptic taſte, accompanied with a ſlight kind of aromatic flavour; it is one of the moſt agreeable and efficacious of the vegetable aſtringents, and is employed with good effect in all caſes where medicines of this claſs are proper. Neumann got from 960 grains, 365 alcoholic, and 170 watery extract, and inverſely 570 watery, and 8 alcoholic.

Off. prep.—Pulv. cret. comp.

TRIGONELLA FOENUM GRÆCUM. *Foenum Græcum. Semen.* (*Lond.*)

Fenugreek. The ſeeds.

Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*

This plant is annual, and a native of the ſouth of France. In Poland it is cultivated in large quantities. The ſeeds have a yellowiſh colour, a rhomboidal figure, a diſagreeable ſtrong ſmell, and a mucilaginous taſte. Their principal uſe was in cataplaſms, fomentations, and the like, and in emollient glyſters. Neumann got from 7680 parts, 620 bitter watery, and 30 unctuous alcoholic, extract, and inverſely 270 very ungrateful alcoholic, and 390 watery. The diſtilled water had a ſlight ſmell of fenugreek, which it ſoon loſt.

TRITICUM.

Willd. g. 152. *Triandria Monogynia.*—Nat. ord. *Gramina.*

Sp. 1. Triticum Æstivum. *Seminum Farina. Amylum.* (*Dub.*)

Sp. 2. Triticum Hybernum. *Farina. Amylum.* (*Lond.*)

Wheat. Flour. Starch.

By ſome theſe are conſidered only as varieties, not as diſtinct ſpecies. The latter, however, is the moſt productive, and is moſt commonly cultivated on that account; for there is no material difference between the grains they produce, which are indiſcriminately employed for every purpoſe.

Wheat-flour conſiſts principally of gluten, ſtarch, albumen, and a ſweet mucilage. Theſe may be ſeparated by forming the flour into a paſte with a little water, and waſhing this paſte with freſh quantities of water, until it runs from it colourleſs. What remains is the gluten: which, if not the ſame, is very analogous to the fibrine of animal ſubſtances. From the water with which the paſte was waſhed, a white powder ſeparates on ſtanding. This is the ſtarch which we have already mentioned under the title Amylum. The albumen and ſweet mucilage remain diſſolved in the water. By evaporating it, the albumen firſt ſeparates in white flakes, and the ſweet mucilage may be got by total evaporation.

It is the preſence of gluten which characterizes wheat flour; and on the due admixture of it with the other conſtituents depends the ſuperiority of wheat-flour for baking bread.

Bread is made by working the flour into a paſte with water, a quantity of ſome ferment, ſuch as yeaſt, and a little muriate of ſoda to render it ſapid, allowing the paſte to ſtand until a certain degree of fermentation take place, and then baking it in an oven heated to about 488°. During the fermentation a quantity of gas is formed, and as it is prevented from eſcaping by the toughneſs of the paſte, and dilated by the heat of the oven, the bread is rendered light and ſpongy. In this proceſs the nature of the conſtituents of the flour is altered, for we are not able to obtain either gluten or ſtarch from bread.

Medical uſe.—Bread is not only one of the moſt important articles of nouriſhment, but is alſo employed in pharmacy for making cataplaſms, and giving form to more active articles. An infuſion of toaſted bread has a deep colour and pleaſant taſte, and is an excellent drink in febrile diſeaſes, and debility of the ſtomach.

TUSSILAGO FARFARA. *Folia. Flores.* (*Ed.*) *Tuſſilago. Herba.* (*Lond.*) *Folia.* (*Dub.*)

Colts foot. The herb and flowers.

Syngeneſia ſuperflua.—Nat. ord. *Compoſitæ radiate.*

This grows wild in moiſt ſituations, producing yellow flowers in February and March: theſe ſoon fall off, and are ſucceeded by large roundiſh leaves, hairy underneath: their taſte is herbaceous, ſomewhat glutinous and ſubacrid. Tuſſilago is recommended in coughs, phthiſis, and other diſorders of the breaſt and lungs, and ſome uſe it in ſcrofula. It is chiefly directed to be taken with milk; and upon this probably, more than on the tuſſilago itſelf, any benefit derived from it in practice is to be explained.

ULMUS CAMPESTRIS. *Cortex interior.* (*Ed.*) *Ulmus. Cortex interior.* (*Lond. Dub.*)

Elm tree. The inner bark.

Willd. g. 505. *ſp.* 1. *Pentandria Digynia.*—Nat. ord. *Scabridæ.*

THIS tree grows wild in Britain. The inner bark has a yellowiſh colour, and a mucilaginous, bitter, aſtringent taſte, without ſmell.

A decoction formed from it, by boiling an ounce with a pound water, to the conſumption of one half, has been highly recommended in the lepra ichthyoſis, and has been ſaid to cure dropſies.

URTICA DIOICA. *Urtica. Herba.* (*Lond.*)

Common nettle. The plant.

Monoecia Tetrandria.—Nat. ord. *Scabridæ.*

THIS is a well known perennial weed. The leaves of the freſh plant ſtimulate, inflame, and raiſe bliſters on thoſe parts of the ſkin which they touch. Hence, when a powerful rubefaciant is required, ſtinging with nettles has been recommended. It has been alleged to have ſometimes ſucceeded in reſtoring ſenſe and motion to paralytic limbs.

VALERIANA OFFICINALIS. *Radix.* (*Ed.*) *Valeriana ſylveſtris. Radix.* (*Lond. Dub.*)

Wild valerian. The root.

Willd. g. 75. *ſp.* 6. *Triandria Monogynia.*—Nat. ord. *Aggregatæ.*

THIS plant is perennial, and grows wild in Britain. Like many other plants, it varies in its appearance and ſenſible qualities, according to the ſituation in which it grows. In marſhes and ſhadowy places its leaves are broader, on dry heaths and high paſtures they are narrower.

The roots produced in low watery grounds, have a remarkably faint ſmell in compariſon of the others, and ſometimes ſcarcely any. The roots taken up in autumn or winter, have alſo much ſtronger ſenſible qualities than thoſe collected in ſpring and ſummer.

The root conſiſts of a number of ſtrings or fibres matted together, iſſuing from one common head, of a whitiſh or pale browniſh colour: its ſmell is ſtrong, like a mixture of aromatics with fetids; the taſte unpleaſantly warm, bitteriſh, and ſubacrid. Neumann got from 480 grains of the dry root 186 alcoholic, and 74 watery extract; and inverſely, 261 watery and 5 alcoholic. The diſtilled alcohol was ſlightly, the water ſtrongly, impregnated with the ſmell of the valerian, but no ſeparable oil was obtained.

Medical uſe.—Wild valerian is a medicine of great uſe in nervous diſorders, and is particularly ſerviceable in epilepſies proceeding from a debility of the nervous ſyſtem.

Some recommend it as uſeful in procuring ſleep, particularly in fever, even when opium fails: but it is principally uſeful in affections of the hyſterical kind.

The common doſe is from a ſcruple to a drachm in powder: and in infuſion, from one to two drachms. Its unpleaſant flavour is moſt effectually concealed by a ſuitable addition of mace.

As its virtues reſide entirely in an eſſential oil, the decoction and watery extract are improper forms for exhibiting it.

Off. prep.—Tinct. *Lond.* Tinct. ammon. *Lond. Dub.* Extract, *Dub.*

VERATRUM ALBUM. *Radix.* (*Ed.*) *Helleborus albus. Radix.* (*Lond. Dub.*)

White hellebore. The root.

Polygamia Monoecia.—Nat. ord. *Liliaceæ.*

THIS plant grows ſpontaneouſly in Switzerland and the mountainous parts of Germany. The root has a nauſeous, bitteriſh, acrid taſte, burning the mouth and fauces: if wounded when freſh, it emits an extremely acrimonious juice, which, when inſerted into a wound, is ſaid to prove very dangerous. Neumann got from 960 grains 560 watery and 10 alcoholic extract; and inverſely, 420 alcoholic and 180 watery. Nothing roſe in diſtillation.

Medical uſe.—The powder of the dried root, applied to an iſſue, occaſions violent purging; ſnuffed up the noſe, it proves a ſtrong, and not always a ſafe, ſternutatory. Taken internally, it acts with extreme violence as an emetic; and has been obſerved, even in a ſmall doſe, to occaſion convulſions, and even death. The ancients ſometimes employed it in very obſtinate caſes, and always made this their laſt reſource. Modern practice ſeems to have almoſt entirely rejected its internal uſe, though ſome have ventured upon ſo large a doſe as a ſcruple, in maniacal caſes, and are ſaid to have experienced good effects from it.

Off. prep.—Decoct. *Lond.* Tinct. *Ed.* Ungt. *Lond. Dub.*

VERONICA BECCABUNGA. *Beccabunga. Herba* (*Lond.*) *Folia.* (*Dub.*)

Brooklime. The herb.

Willd. g. 44. *ſp.* 30. *Diandria Monogynia.*—Nat. ord. *Perſonatæ.*

THIS is a low perennial plant, common in little rivulets and ditches of ſtanding water. The leaves remain all the winter, but are in greateſt perfection in the ſpring. Their prevailing taſte is an herbaceous one, accompanied with a very light bitterneſs.

If any good effects be expected from brooklime, it ſhould be uſed as food.

Off. prep.—Succus coch. comp. *Lond.*

VIOLA ODORATA. *Flores.* (*Ed. Viola. Flos recens.* (*Lond.*) *Flores.* (*Dub.*)

March violet. The recent flower.

Willd. g. 446. *ſp.* 12. *Pentandria Monogynia.*—Nat. ord. *Campanaceæ.*

THIS plant is perennial, and is found wild under hedges and in ſhady places; but the ſhops are generally ſupplied from gardens. Its flowers are ſo remarkable for their delightful odour, and their peculiar richneſs of colour, that they have given a name to both.

In our markets we meet with the flowers of other ſpecies: theſe may be diſtinguiſhed from the foregoing by their being larger, of a pale colour, and of no ſmell.

Med. uſe.—They impart their colour and flavour to aqueous liquors: a ſyrup made from this infuſion has long maintained a place in the ſhops, and is ſaid to be an agreeable and uſeful laxative for children; but is chiefly valued as a delicate teſt of the preſence of uncombined acids or alkalies, the former changing its blue to a red, and the latter to a green colour.

Off prep.—Syr. violæ odorat. *Ed. Lond. Dub.*

VITIS VINIFERA. *Fructus ſiccatus, ejusque ſuccus fermentatus.* (*Ed.*) *Vitis. Fructus. Uva paſſa, Vinum. Tartarum, Tartari cryſtalli. Acetum.* (*Lond.*) *Uvæ paſſæ. Vinum album Hiſpanicum, Vin. album Rhenanum, Vin. rubrum Luſitanicum.* (*Dub.*)

The vine. Grapes. Raiſins. Wine. Tartar. Cryſtals of tartar. Vinegar.

Willd. g. 453. *ſp.* 1. *Pentandria Monogynia.*—Nat. ord. *Hederaceæ.*

THE vine grows in temperate ſituations in many parts of the world, and is cultivated very generally for the ſake of its agreeable ſubacid fruit. Before they are ripe, grapes are extremely harſh and acid, and by expreſſion furniſh a liquor which is called Verjuice. It contains malic acid, ſuper-tartrate of potaſs, and extractive, and may be made to furniſh wine by the addition of ſugar. As the grape advances to maturity, the quantity of ſugar increaſes, while that of malic acid diminiſhes: it however never diſappears entirely. When thoroughly ripe, the grape is one of the moſt agreeable fruits. It is cooling, antiſeptic, and nutritious; and, when eaten in conſiderable quantity, diuretic, and gently laxative. In inflammatory diſeaſes, and all others where acids are indicated, they form an excellent article of diet.

RAISINS, *uvæ paſſæ*, are grapes which have been carefully dried. By this means not only the water they contained is diſſipated, but the quantity of acid ſeems to be diminiſhed. They become more ſaccharine, mucilaginous, and laxative, than the recent grape, but are leſs cooling.

Off. prep.—Decoct. alth. off. *Ed.* Decoct. guiac. comp. *Ed.* Decoct. hord. comp. *Lond.* Tinct. card. comp. *Lond. Dub.* Tinct. ſennæ, *Lond. Dub.*

WINE is the juice of the grape altered by fermentation. The numerous varieties of wine depend principally on the proportion of ſugar contained in the muſt, and the manner of its fermentation. When the proportion of ſugar is ſufficient, and the fermentation complete, the wine is perfect and generous: if the quantity of ſugar be too large, part of it remains undecompoſed, as the fermentation is languid, and the wine is ſweet and luſcious; if, on the contrary, it be too ſmall, the wine is thin and weak; and if it be bottled before the fermentation be completed, it will proceed ſlowly in the bottle, and, on drawing the cork, the wine will froth and ſparkle in the glaſs, as for example Champaigne. When the muſt is ſeparated from the huſk of the grape before it is fermented, the wine has little or no colour: theſe are called White wines. If, on the contrary, the huſks are allowed to remain in the muſt while the fermentation is going on, the alcohol diſſolves the colouring matter of the huſks, and the wine is coloured: ſuch are called Red wines. Beſides in theſe principal circumſtances, wines vary very much in flavour. The red wines moſt commonly drunk in this country are Port, which is ſtrong and auſtere, containing much tannin, and Claret, which is thinner and higher flavoured. Our white wines are all ſtrong, Madeira, Sherry, Liſbon, Malaga, and Hock. Of theſe the laſt is the moſt acidulous, and Malaga the ſweeteſt.

Med. uſe.—Wine, taken in moderate quantities, acts as a beneficial ſtimulus to the whole ſyſtem. It promotes digeſtion, increaſes the action of the heart and arteries, raiſes the heat of the body, and exhilerates the ſpirits. Taken to exceſs, it produces inebriety, which is often ſucceeded by headach, ſtupor, nauſea, and diarrhœa, which laſt for ſeveral days. Habitual exceſs in wine debilitates the ſtomach, produces inflammation of the liver, weakens the nervous ſyſtem, and gives riſe to dropſy, gout, apoplexy, tremors, and cutaneous affections.

To convaleſcents, and in all diſeaſes of general debility, and deficiency of the vital powers, wine is the remedy on which we muſt place our chief dependance; and when properly adminiſtered, its effects are often ſcarcely credible.

The uſe of wine, as an article of pharmacy, will be noticed hereafter.

WINTERA AROMATICA. *Cortex.* (*Ed.*) *Winteranus Cortex officinarum.*

Winters bark.

Willd. g. 1063. *Polyandria Tetragynia.*—Nat. ord. *Oleraceæ.*

This is the produce of a tree growing about the ſouthern promontory of America. It was firſt diſcovered on the coaſt of Magellan by Captain Winter, in the year 1567: the ſailors then employed the bark as a ſpice, and afterwards found it ſerviceable in the ſcurvy; for which purpoſe it is at preſent alſo ſometimes made uſe of in diet drinks. The true Winters bark is not often met with in the ſhops, Canella alba being generally ſubſtituted for it, and by ſome they are reckoned to be the ſame: there is, however, a conſiderable difference betwixt them in appearance, and a greater in quality. The Winters bark is in large pieces, of a more cinnamon colour than the canella, and taſtes much warmer and more pungent. Its ſmell reſembles that of caſcarilla. Its virtues reſide in a very hot, ſtimulant, eſſential oil.

ZINCUM. (*Ed. Dub. Lond.*)
Zinc.

The general properties of zinc have been already noticed. It is always found oxidized,

1. Combined with a greater or leſs proportion of carbonic acid. Calamine.
2. Combined with ſulphur. Blende.
3. Combined with ſulphuric acid, generally in ſolution.

The ores of zinc are rarely worked by themſelves, or with the ſole intention of extracting zinc, but are generally melted with the lead ores, particularly galena, which they commonly accompany. By this proceſs the zinc is obtained in two forms; part of it is ſublimed in the ſtate of an oxide, and attaches itſelf to the chimney of the furnace in the form of a grey, grenular, earthy-like, incruſtation, which is known by the name of tutty or cadmia; part of it is ſublimed in its metallic form, and is condenſed in the throat of the chimney in ſmall grains, which are afterwards melted in a crucible, and caſt in ingots.

Off. prep.—Oxidum zinci, *Ed. Lond. Dub.* Sulphas zinci, *Ed. Lond. Dub.*

Oxidum Zinci Impurum. (*Ed.*) *Tutia.* (*Lond. Dub.*)
Impure oxide of zinc. Tutty.

It is moderately hard and ponderous; of a browniſh colour, and full of ſmall protuberances on the outſide, ſmooth and yellowiſh within; ſome pieces have a bluiſh caſt, from minute globules of zinc in its metallic form. Tutty is celebrated as an ophthalmic, and frequently employed as ſuch in ungents and collyria.

Off. prep.—Oxidum zinci imp. ppt. *Ed. Lond.* Ungt. *Ed. Lond. Dub.*

CARBONAS ZINCI IMPURUS. (*Ed.*) *Lapis Calaminaris.* (*Dub. Lond.*

Impure carbonate of lime. Calamine.

THIS mineral is found plentifully in England, Germany, and other countries, either in diſtinct mines, or intermingled with the ores of different metals. It is uſually of a greyiſh, browniſh, yellowiſh, or pale reddiſh colour; without luſtre, or tranſparency; fracture commonly uneven or earthy; conſiderably hard, though not ſufficiently ſo as to ſtrike fire with ſteel. Before the blowpipe it decrepitates, but does not melt, and becomes yellower, and is ſublimed. It is partly ſoluble in acids, and often effervesces with them.

Mr. Smithſon has analyſed ſeveral varieties of Calamine.

	Sp. Grav.	*Ox.of Zinc.*	*Carb.Acid.*	*Water.*	*Quartz.*
Derbyſhire	4·333	65.2	34·8		
Somerſetſhire	4·336	64 8	35·2		
Carinthia	3·598	71.4	13·5	15·1	
Hungary	3·434	68·3		4·4	25·
Fribourg		38.		12·	50.

Calamine is generally roaſted before it comes into the ſhops, to under it more eaſily reducible into a fine powder. In this ſtate it is employed in collyria, againſt defluxions of thin acrid humours upon the eyes, for drying up moiſt running ulcers, and healing excoriations.

Off. prep.—Cerat. *Ed. Lond. Dub.* Carb. zinci imp. ppt. *Ed. Lond. Dub.*

SULPHAS ZINCI. *Vitriolum album.* (*Lond. Dub.*)

Sulphate of zinc. White vitriol.

THIS is chiefly found native in the mines of Goſlar, ſometimes in tranſparent pieces, but more commonly in the form of white efflorences, which are diſſolved in water, and afterwards reduced by evaporation and cryſtallization into large maſſes. But as native ſulphate of zinc is ſeldom pure, it is ordered to be prepared.

Medical uſe.—White vitriol is ſometimes given, from five or ſix grains to half a drachm, as an emetic; it operates very quickly, and, if pure, without violence. Externally, it is employed as an ophthalmic, and often made the baſis of collyria, both in extemporaneous preſcription and in diſpenſatories.

APPENDIX.

No. 1.

List of Subſtances contained in some of the lateſt and moſt eſteemed foreign Pharmacopœias, but not inſerted in the Materia Medica of any of the British Colleges.

EXPLANATION OF THE ABBREVIATIONS.

Roſſ.—Pharmacopœia Roſſica. 8vo. Petropoli, 1798.

Auſt. prov.—Pharmacopœia Auſtriaco-provincialis, emendata. 8vo. Viennæ, 1794.

Auſt. caſt.—Pharmacopœia Auſtriaco-caſtrenſis. 8vo. Ticini. 1795.

Brem.—Pharmacopœia in uſum officinarum Reipublicæ Bremenſis conſcripta. 8vo. Bremæ, 1792.

Bor.—Pharmacopœia Boruſſica. 4to. Berolini, 1799.

Gen.—Formulario farmaceutico per uſo dell' Oſpedale di Pammatone. 8vo. Genova, 1800.

Mar.—Apparatus medicaminum noſocomiis, generatim curationi ægrotorum pauperum maxime accomodus Franciſci Marabelli. 8vo. Bataviæ, anno Reipub. Gall. VIto. 1798.

Van M.—Pharmacopée manuelle, par J. B. Van Mons. 8vo. A Bruxelles, an. IX. 1801.

La G.—Manuel du Pharmacien par E. J. B. Bouillon La Grange. 8vo. A Paris, an. XI. 1803.

ACHILLEA MILLEFOLIUM. *Millefolii herba, flores.* Roſſ. Auſt. prov. Brem. Bor. La G.

Smell ſomewhat aromatic; taſte ſlightly aſtringent and bitteriſh; effects ſtomachic and tonic.

ACHILLEA NOBILIS. *Millefolii nobilis herba, flores.* Roſſ. Smell camphoraceous and aromatic, preferable in every reſpect to the preceding ſpecies.

ACHILLEA PTARMICA. *Ptarmicæ radix; Herba, cum floribus.* Roſſ.

No ſmell; taſte acrid; effects ſialogogue, ſternutatory.

ADIANTUM CAPPILUS VENERIS. *Capillus veneris. Herba.* Auſt. prov. Van M. La G.

Uſed for preparing the ſyrup called Capillaire.

AGARICUS MUSCARIUS. Roſſ.

Smell fetid; taſte acrid; effects inebriating, and inducing delirium.

AGRIMONIA EUPATORIA. *Agrimonia. Herba.* Auſt. prov. Brem. La G.

Slightly ſtyptic and aſtringent.

ALCEA ROSEA. *Malvæ arboreæ flores.* Roſſ. Brem. Bor.

No ſmell; taſte mucilaginous and ſub-aſtringent; effects emollient and ſubaſtringent.

AMBRA AMBROSIACA GRYSEA. *Ambra gryſea.* Roſſ. Bor. Van M.

Smell agreeable; taſte reſinous and aromatic; effects exciting and augmenting the nervous power.

AMOMUM CURCUMA. Van M. *Curcumæ radix.* Bor.

Taſte bitteriſh aromatic.

AMOMUM GRANA PARADISI. *Grana paradiſi.* Brem. La G.

Smell ſlightly aromatic; taſte acrid; effects ſtimulating.

AMYGDALUS NANA. *Nuclei.* Roſſ.

No ſmell; bitteriſh taſte; a ſubſtitute for ſweet almonds.

AMYGDALUS PERSICA. *Flores.* Van M. La G.
Aromatic; bitter; laxative.

ANAGALLIS ARVENSIS. *Anagallis. Herba.* Auſt. prov. Brem. Roſſ. Bor.
No ſmell; taſte, at firſt harbaceous, afterwards bitter and ſomewhat acrid.

ANEMONE PRATENSIS. *Pulſatillæ nigricantis herba.* Roſſ. Auſt. prov. Brem.
Smell ſlight; taſte acrid, cauſtic, durable; effects diuretic and ſtimulant.

ANEMONE NEMOROSA. *Ranunculi albi flores, et herba recens.* Roſſ.
Smell ſlight; taſte acrid; effects rubefacient and bliſtering.

ANTIRRHINUM LINARIA. *Linaria.* Auſt. prov. Brem. Bor.
Smell urinous; taſte bitteriſh; effects diuretic.

ARISTOLOCHIA CLEMATITIS. *Ariſtolochia vulgaris. Radix.* Roſſ.
Smell fragrant, but heavy; taſte bitter, durable; effects diuretic, emmenagogue.

ARISTOLOCHIA LONGA. *Radix.* La G.

ARISTOLOCHIA ROTUNDA. *Radix.* Brem. Bor. La G.
Smell, taſte, and effects, ſimilar to thoſe of the preceding ſpecies.

ARISTOLOCHIA TRILOBATA. *Stipites. Radix.* Roſſ.
Smell fragrant, ſtrong; taſte bitteriſh, correſponding with the ſmell; effect diaphoretic.

ARTEMISIA PONTICA. *Abſynthium ponticum. Herba.* Auſt. prov.
Similar to A. abſinthium, but weaker.

ASCLEPIAS VINCETOXICUM. *Radix.* La G.
Stimulant cordial; diaphoretic.

ASPARAGUS SATIVUS. *Radix.* La G.
Taſte, bitter-ſweet; mucilaginous; aperitive, imparting its ſmell to the urine.

ASPLENIUM SCOLOPENDRIUM. *Folia.* Van M.
Sub-aſtringent.

ASTRAGALUS EXSCAPUS. *Radix.* Roſſ. Auſt. prov. Brem.

No ſmell; taſte bitteriſh and ſub-aſtringent; effects demulcent, and falſely ſuppoſed antiſyphilitic.

AURUM. La G.

BELLIS PERENNIS. *Flos. Folium.* Auſt. prov.
No ſmell; taſte ſlightly acrid.

BETONICA OFFICINALIS. *Folia.* La G.
Aperitive.

BETULA ALNUS. *Alni folia.* Roſſ.
No ſmell; taſte aſtringent and bitteriſh; effects diſcutient and vulnerary.

BISMUTHUM, vulgo MARCASITA. Bor.
A very brittle, fuſible, and volatile metal. When diſſolved in nitric acid, it is precipitated in the form of a white oxide by water.

BITUMEN ASPHALTUM. *Aſphaltum.* Bor.
A black friable bitumen, ſhining in its fracture.

BOLETUS LARICIS. *Agaricus albus. Agaricus chirurgorum.* Brem. Auſt. prov. Bor. Van M. La G.
Taſte nauſeous and bitter; effects emetic, cathartic, draſtic.

BOLETUS SALICIS. Bor.
An unequally porous fungus growing in the willow, and diffuſing an aromatic ſmell, eſpecially after rain.

BOLUS ALBA. Auſt. prov.

BOLUS ARMENA. Auſt. prov. Bor. Van M.
No ſmell; adhere to the tongue; effects exſiccative.

BORAGO OFFICINALIS. *Folia, flores.* Van M. La G.
Saline; aperitive.

BOS TAURUS. *Lac vaccinum.* Auſt. prov. Gen. Bor. Van M.
Nutritious; demulcent.

Serum lactis vaccini. Mar.
Attenuant; antiſeptic.

Saccharum lactis. Bor.
Nutritious; demulcent.

Butyrum. Van M.
Unctuous.

Sevum Bovinum. Roſſ. Auſt. caſt.
Unctuous, emollient.

Fel tauri. Bor. Mar. Van M.
Stomachic.

BRASSICA (ERUCA). *Erucæ ſemina.* Roſſ. Bor.
Smell heavy; taſte acrid; effects ſtimulant.

BRUNELLA VULGARIS. *Folia.* La G.
Vulnerary; aſtringent.

BUBON MACEDONICUM. *Semina.* La G.
Acrid; aromatic.

BUGLOSSUM OFFICINALE. *olia, flores.* La G.
Demulcent.

CALENDULA OFFICINALIS. *Calendula.* Auſt. prov. Van M.
Taſte bitteriſh.

CANNABIS SATIVA. *Cannabis. Semina.* Roſſ. Brem. Bor. Van M.
Smell weak; taſte mawkiſh; effects emollient; anodyne.

CARBO. Van M.
Antiſeptic; diſoxygenizing.

CARDUUS MARIANUS. *Carduus Mariæ. Semen.* Brem.
Emulſive.

CAREX ARENARIA. *Radix.* Roſſ. Bor.
Smell agreeable, but not ſtrong; effects demulcent, reſolvent.

CARLINA ACAULIS. *Carlinæ, ſeu Cardopathiæ, Radix.* Bor. La G.
Taſte very acrid and bitter; ſmell ſomewhat aromatic, but nauſeous.

CARTHAMUS TINCTORIUS. *Grana.* La G.
Cathartic.

CERATONIA SILIQUA. *Siliqua dulcis.* Roſſ. Auſt. prov. Brem. Bor.
No ſmell; taſte ſweet; effects edulcorant, expectorant.

CHELIDONIUM MAJUS. *Radix. Herba recens.* Roſſ. Auſt. prov. Brem.
Smell heavy; taſte acrid, bitteriſh, durable; effects acrid, purgative; when dried, aperient, diuretic.

CHENOPODIUM AMBROSIOIDES. *Chenopodii herba.* Brem. Bor. Van M.

Smell ſtrong, fragrant; taſte acrid, aromatic; effects ſtimulant, caminative, anthelmintic.

CHENOPODIUM BOTRYS. *Botrys vulgaris. Herba.* Roſſ. Van M.

Qualities and effects ſimilar to, but ſtronger than, thoſe of the preceding ſpecies.

CICHORIUM INTYBUS. *Cichorii radix, herba.* Roſſ. Auſt. prov. *et* caſt. Brem. La G. Van M. Gen. Bor. Mar.

No ſmell; taſte of the herb agreeably bitter, of the root intenſely bitter; effects aperient, tonic, diuretic.

CICUTA VIROSA. *Herba.* Bor.

Smell heavy; narcotic.

CLEMATIS ERECTA. *Flammulæ Jovis folia, flores.* Roſſ. Auſt. prov. Bor. Van M.

Smell weak; taſte acrid, bliſtering; effects diuretic, ſudorific.

COLUBER VIPERA. La G.

Nutritious.

CONFERVA DICHOTOMA. *Fucus helminthocortos. Helminthocorton.* Roſſ. Brem. Gen. Bor. Mons.

Smell marine, fetid; taſte ſaline; effects purgative, anthelmintic.

CONVALLARIA MAJALIS. *Liliorum convallium flores.* Bor. Mons. La G.

Aromatic; cephalic.

CONVOLVULUS AMERICANUS. *Mechoacanna. Radix.* Brem. La G.

Taſte at firſt ſweetiſh, then ſub-acrid; effect purgative.

CONVOLVULUS TURPETHUM. *Radix.* Van M.

Cathartic.

CORDIA MYXA. *Fructus.* La G.

Pectoral.

CUCUMIS MELO. *Melo. Semen.* Auſt. prov. Bor.

Emulſive.

CUCURBITA PEPO. *Pepo. Semen.* Auſt. prov.

Emulſive.

CYCAS CIRCINALIS. *Sago grana.* Roſſ. Brem.
Amylaceous; nutritious.

CYNOGLOSSUM OFFICINALE. *Radix.* Van M. La G.
Aſtringent; inſpiſſant.

CYNOMORIUM COCCINEUM. *Fungus Melitenſis.* Roſſ.
No ſmell; taſte ſtyptic, bitteriſh, ſaline; effects roborant, aſtringent.

CYTINUS HYPOCISTIS. *Hypociſtis. Succus inſpiſſatus.* Auſt. prov.
Taſte acid, auſtere; effect aſtringent.

DICTAMNUS ALBUS. *Radix.* Auſt. prov. Brem. Bor. La G.
Smell fragrant; taſte bitter, ſub-aromatic; effects tonic, anthelmintic.

DIGITALIS EPIGLOTTIS. *Folia.* Gen.
An Italian ſubſtitute for the D. propurea.

EPIDENDRUM VANILLA. *Vanillæ ſiliqua.* Roſſ. Van M. La G.
Smell fragrant, balſamic; taſte aromatic, ſub-acid, unctuous; effects heating, diuretic.

ERINGIUM CAMPESTRE. *Radix.* La G.
Aperitive; diuretic.

EUPATORIUM CANNABINUM. *Folia.* Van M.
Smell acrid, penetrating; taſte intenſely bitter; diuretic; emetic; cathartic.

EUPHORBIA OFFICINALIS. *Euphorbii gummi.* Roſſ. Auſt. prov. Ber. Van M.
No ſmell; taſte at firſt none, then pungent, burning; effects acrid, draſtic.

EUPHRASIA OFFICINALIS. *Herba.* Van M. La G.
Ophthalmic.

ERYSIMUM OFFICINALE. *Eryſimum. Herba.* Brem. La G.
Taſte acrid; effects aſtringent, diuretic.

FAGARA OCTANDRA. *Tacamahaca. Gummi-reſina.* Roſſ. Bor.
Smell fragrant like lavender; taſte bitteriſh, nauſeous; effects tonic, ſtimulant.

FICUS INDICA RELIGIOSA. *Laccæ gummi.* Roſſ. Brem. Bor.
Reſinous.

FORMICA RUFA. *Formicæ cum acervo.* Roſſ. Brem. Bor.
Qualities and effects depend on the little acetous acid they contain.

FRAGARIA VESCA. *Radix.* Van M.
Refrigerant; diuretic.

GADUS LOTA. *Muſtela fluviatilis. Liquamen hepatis.* Auſt. prov.
Detergent; ſolvent.

GENTIANA PANNONICA. *Gentiana. Radix.* Auſt. prov. *et* caſt.
Qualities and effects the ſame as thoſe of the gentiana lutea.

GEUM RIVALE. *Gei paluſtris radix.* Roſſ.
Smell weak; taſte ſtyptic, auſtere; effects tonic, aſtringent, febrifuge.

GEUM URBANUM. *Caryophyllatæ radix.* Roſſ. Auſt. prov. Brem. Bor. La G.
Smell caryophyllaceous, loſt by drying; taſte ſtyptic, bitter; effects tonic, aſtringent, febrifuge; ſaid to be an excellent ſubſtitute for Peruvian bark.

GLECOMA HEDERACEA. *Hedera terreſtris. Herba.* Auſt. prov. Brem. Bor. Van M. La G.
Taſte bitteriſh, ſub-acrid; effects expectorant, roborant.

GLYCYRRHIZA ECHINATA. *Liquiritia, radix.* Bor.
A Ruſſian ſubſtitute for the G. glabra.

GUILANDINA MORINGA. *Nuces Behen.* Bor.
Oily.

HEDERA HELIX. *Gummi-reſina.* La G.
Agglutinant.

HIRUDO MEDICINALIS. *Hirudo. Animal vivum.* Auſt. caſt. Gen. Bor. Mar.
Topical abſtraction of blood.

HUMULUS LUPULUS. *Lupuli ſtrobuli.* Bor. La G.
Agreeably bitter; anodyne; diuretic; reſolutive.

HYPERICUM QUADRANGULARE. *Hypericum. Flores.* Brem.
Smell agreeable; taſte bitteriſh, ſub-aſtringent, balſamic; effects vulnerary.

ILEX AQUIFOLIUM. *Aquifolii folia.* Roſſ. Bor.
No ſmell; taſte aſtringent; effects febrifuge, antiarthritic.

ILLICIUM ANISATUM. *Aniſum ſtellatum. Fructus.* Auſt. prov. Brem. Roſſ. Bor. Van. M. La G.
Smell aromatic; taſte agreeable, like aniſe; effects pectoral, carminative, diuretic.

IMPERATORIA OSTRUTHIUM. *Imperatoriæ radix.* Roſſ. Auſt. prov.
Smell aromatic; taſte warm, pungent, very durable; effects ſtimulant, carminative, ſudorific, diuretic.

JASMINUM OFFICINALE. *Jaſmini flores.* Roſſ. Brem.
Smell fragrant; taſte bitteriſh; uſed as a perfume.

LACTUCA SATIVA. *Folia.* La G.
Refreſhing; anodyne.

LAMIUM ALBUM. *Flores.* Van M. La G.
Aſtringent; tonic.

LAURUS PECHURIM. *Faba.* Van M.
Bitter, aromatic; ſtimulant ſtomachic.

LEDUM PALUSTRE. *Roriſmarini ſylveſtris herba.* Roſſ. Auſt. prov. Bor.
Smell heavy, ſub-aromatic; taſte bitteriſh, ſub-aſtringent; effects reſolvent, diuretic.

LEPIDIUM SATIVUM. *Folia, ſemina.* La G.
Antiſcorbutic, aperitive, diuretic.

LICHEN ISLANDICUS. Auſt. prov. *et* caſt. Brem. Roſſ. Gen. Bor. Mar. La G. Van M.
No ſmell; taſte bitteriſh, ſubaſtringent; effect nutritious.

LICHEN PULMONARIUS. La G.
Taſte ſaline, bitter; pectoral.

LIGUSTICUM LEVISTICUM. *Leviſtici herba, radix, ſemen.* Roſſ. Auſt. prov. Brem. Bor
Smell unpleaſant; taſte warm, aromatic; effects ſtimulant, carminative, ſudorific.

LIQUIDAMBAR STYRACIFLUUM. *Styrax liquida. Balſamum.* Auſt. prov. Bor. Van M. La G.
Smell fragrant; taſte acrid, aromatic; effects ſtimulating, heating.

LONICERA DIERVILLA. *Diervillæ ſtipites.* Roſſ.
Taſte and ſmell nauſeous; effects antivenereal.

LOPEZIANA RADIX. Van M.

LORANTHUS EUROPÆUS. *Viſcum quercinum. Lignum.* Auſt. prov.
Smell nauſeous; taſte aſtringent, mucilaginous; effects tonic.

LUPINUS ALBUS. *Farina.* Gen.
Farinaceous; bitter.

LYCOPERDON BOVISTA. Roſſ.
No taſte or ſmell; effects mechanical, ſuppreſſion of hæmorrhagy.

LYCOPODIUM CLAVATUM. *Lycopodii ſemen.* Roſſ. Brem. Bor. La G.
No taſte or ſmell; effects abſorbent.

LYTHRUM SALICARIA. *Lyſimachia purpurea. Herba.* Brem. *Salicaria.* Auſt. prov.
No ſmell; taſte ſubaſtringent; effects aſtringent, tonic.

MALVA ROTUNDIFOLIA. *Folia et flores.* Gen.
Demulcent.

MANGANESIUM. *Manganeſium oxidatum nativum.* Bor. *Magneſia nigra.* Roſſ. *Magneſia vitrariorum.* Auſt. prov.
Uſed for the production of oxygen gas, oxymuriatic acid, and ſome other chemical preparations.

MARANTA GALANGA. *Galangæ radix.* Roſſ. Auſt. prov. Brem. Bor. Van M. La G.
Smell fragrant; taſte aromatic, pungent, biting; effects ſtomachic, heating.

MATRICARIA CHAMOMILLA. Mons. *Chamomillæ vulgaris, flores, herba.* Roſſ. Auſt. prov. *et* caſt.—Berm. Bor. Mar.
Smell ſtrong; taſte bitter, warmiſh; effects ſtomachic, diſcutient. Subſtitute for chamomile.

MATRICARIA PARTHENIUM. *Matricaria. Flos, herba.* Auſt. prov. Bor. Van M. La G.
Smell nauſeous; taſte bitter; effects ſtomachic.

MELISSA CALAMINTHA. *Folia.* La G.
Anti-hyſteric.

MELOE PROSCARABÆUS. Auſt. prov. *Meloë majalis.* Brem. *Vermis majalis.* Roſſ. Bor.
No ſmell; taſte acrid; effects ſtimulating, diuretic, cauſtic.

MENTHA CRISPA *Herba.* Roſſ. Auſt. prov. Brem. Gen. Mar. Van M.
Smell fragrant, ſtrong; taſte warm, aromatic, ſlightly bitter; effects reſolvent, ſtomachic, carminative.

MENTHA AQUATICA. *Mentha rubra. Oleum deſtillatum.* Auſt. caſt.
Similar to the former.

MERCURIALIS ANNUA. *Herba.* Van M. La G.
Purgative.

MIMOSA SENEGAL. *Arabicum gummi.* Brem.
Suppoſed to produce the fineſt gum-arabic.

MYROBALANUS CITRINA. *Cortex fructuum. Terminaliæ ſpecies?* Auſt. prov.
Taſte aſtringent; effects aſtringent.

NARCISSUS PSEUDO-NARCISSUS. *Flores.* Van M.
Fragrant; antiſpaſmodic.

NIGELLA SATIVA. *Nigella. Semen.* Brem. La G.
Smell fragrant; taſte acrid, aromatic; effects ſtimulating, errhine, ſialogogue, anthelmintic.

NYMPHÆA LUTEA. *Radix.* La G.
Demulcent.

OCIMUM BASILICUM. Van M. *Baſilici herba.* Bor.
Smell fragrant; expectorant.

ONONIS SPINOSA. *Ononis radix.* Auſt. prov. Mar.
No ſmell; taſte ſweetiſh; effects diuretic.

ONOPORDUM ACANTHIUM. *Cardui tomentoſi herba recens.* Roſſ.
No ſmell; taſte bitteriſh; effects ſpecific, the cure of cancerous affections.

ORCHIS MASCULA, MORIO, MILITARIS, MACULATA, PYRAMIDALIS, et LATIFOLIA. *Salep. Satyrium. Radix.* Roſſ. Auſt. prov. *et* caſt. Brem. Bor. Van M.
Taſte amylaceous; effects nutritious.

ORIGANUM DICTAMNUS. *Dictamnus Creticus. Herba.* Brem.
Smell ſlight, aromatic; taſte aromatic; effects ſtimulant.

ORYZA SATIVA. *Oryzæ ſemen decorticatum.* Roſſ. Van M.
Taſte farinaceous; effects nutritious, aſtringent.

PÆONIA OFFICINALIS. *Pæoniæ radix.* Roſſ. Brem. Bor. La G.
Smell unpleaſant; taſte at firſt ſweetiſh, then diſagreeably bitter; effects antiſpaſmodic.

PECHURIM FABA. *Ex Lauro quadam.* Roſſ.
Smell fragrant, durable; taſte aromatic; effects ſtomachic, aſtringent.

PHOENIX DACTYLIFERA. *Fructus.* Van M. La G.
Demulcent.

PHELLANDRIUM AQUATICUM. *Semen.* Roſſ. *Fœniculum aquaticum.* Brem. Bor.
Smell heavy; taſte aromatic, acrid; effects ſtimulating, reſolvent.

PHYSALIS ALKEKENGI. *Bacca.* Van M. La G.
Diuretic.

PHYTOLACCA DECANDRA. *Phytolaccæ herba recens, radix.* Roſſ.
No ſmell; taſte acrid, corroſive; effects corroſive in cancer.

PIMPINELLA SAXIFRAGA. *Pimpinellæ albæ radix.* Roſſ. Auſt. prov. Brem. Bor. La G.
Smell fragrant; taſte warm, acrid; effects ſtomachic, diaphoretic, diuretic.

PINUS PINEA. *Pinus ſativa. Nuclei.* Auſt. prov.
Taſte ſweet, bland; effects nutritious.

PISTACIA VERA. *Fructus.* La G.
Nouriſhing; analeptic.

PLANTAGO MEDIA. *Plantago. Herba.* Auſt. prov.
Taſte ſub-aſtringent; effects aſtringent.

PLANTAGO PSYLLIUM et CYNOPS. *Pſyllii ſemen.* Roſſ. Bor.
Taſte nauſeous, mucilaginous, then acrid; effects relaxant.

POLYGALA AMARA. *Herba, radix.* Roſſ. Brem. Gen. Bor. Van M.
No ſmell; taſte bitter, acidulous, mucilaginous; effects demulcent, roborant.

POLYGALA VULGARIS. *Polygala. Radix.* Auſt. prov. Mar.
Taſte ſweetiſh, bitter; effects tonic, expectorant. Subſtitute for ſeneka.

POLYPODIUM VULGARE. *Polypodii radix.* Roſſ. Auſt. prov. Brem. Bor.
Taſte at firſt ſweet, then nauſeous, bitter and aſtringent; effects demulcent, reſolvent.

POPULUS BALSAMIFERA. *Tacamahaca. Gummi-reſina.* Roſſ. Van M.
Smell fragrant; taſte nauſeous, bitteriſh; effects ſtimulant, tonic.

POPULUS NIGRA. *Gemmæ.* Van M.
Emollient; ſoporiferous.

PRUNUS CERASUS. *Ceraſorum rubrorum acidorum fructus.* Roſſ. Brem. Bor.
Taſte acidulous, ſweetiſh; effects refrigerating, antiſeptic.
Ceraſorum nigrorum aqua. Auſt. prov.
Narcotic.

PRUNUS LAURO-CERASUS. *Lauro-ceraſi folia.* Roſſ. Brem. Bor.
Smell fragrant; taſte bitter like that of bitter almonds; effects highly deleterious, narcotic, reſolvent, diuretic.

PTERIS AQUILINA. *Filicis fœminæ radix.* Roſſ.
Smell nauſeous; taſte viſcid, bitteriſh; effects anthelmintic.

PULMONARIA OFFICINALIS. *Folia.* La G.
Antiphthyſical.

PYRUS MALUS. *Poma acidula.* Bor. Van M.
Acidulous.

RANA ESCULENTA. La G.
Nutritious.

RHAMNUS ZIZYPHUS. *Fructus.* Van M.
Lubricant; expectorant.

RHEUM UNDULATUM. *Rhabarbari Sibirici radix.* Roſſ.

Smell ſlight; taſte bitter and ſlightly aſtringent; effects ſtomachic, purgative.

RHEUM RHAPONTICUM. *Radix.* La G.
Aſtringent.

RUBUS ARCTICUS. *Baccæ.* Roſſ. La G.
Smell fragrant; taſte acidulous, vinous; effects refrigerant, antiſcorbutic. Similar properties are poſſeſſed by the fruits of the *rubus idæus, cæſius, fructicaſus, chamæmorus.*

RUMEX AQUATICUS. *Lapathi aquatici radix.* Roſſ.
Taſte auſtere, bitter; effects tonic, antiſcorbutic.

RUMEX ACUTUS. *Lapathum acutum. Radix.* Auſt. prov. Brem. Bor. Mar. Van M. La G.
Taſte bitteriſh, acidulous; effects aſtringent.

SAGUS FARINARIA. *Medulla.* Van M.
Nutritious.

SALIX ALBA, PENTANDRA, FRAGILIS, VITELLINA. *Salicis cortex.* Roſſ. Bor. Mar.
Smell fragrant; taſte aſtringent, bitter; effects tonic, febrifuge.

SALVIA HORMINUM. *Folia.* La G.
Aſtringent, tonic.

SAMBUCUS EBULUS. *Ebulus. Radix.* Auſt. prov.
Smell fetid; taſte nauſeous, bitter, acrid; effects draſtic, cathartic, emetic, narcotic.

SANICULA EUROPÆA. *Folia.* La G.
Harſh, herbaceous taſte.

SAPONARIA OFFICINALIS. *Saponariæ radix.* Roſſ. Auſt. prov. *et* caſt. Brem. Bor. Mar. Van M. La G.
No ſmell; taſte ſlightly ſweet, bitter and glutinous; effects detergent.

SCABIOSA SUCCISA. *Radix.* La G.
Alexipharmic.

SCABIOSA ARVENSIS. *Scabioſa. Folium.* Auſt. prov. Van M.
Taſte ſlightly bitter; effects expectorant, vulnerary.

SCANDIX CEREFOLIUM. *Cerefolii herba. Succus.* Brem. Auſt. prov.
Smell weak, balſamic; taſte aromatic, balſamic; effects aperient, pectoral, diuretic.

SCORZONERA HISPANICA. *Scorzonera. Radix.* Auſt. prov. Bor.
Taſte ſweetiſh; effects aperient, demulcent.

SCROPHULARIA NODOSA. *Scrophularia. Folium. Radix.* Auſt. prov.
Smell unpleaſant; taſte nauſeous, bitter; effects attenuant.

SECALE CEREALE. *Secalis farina.* Auſt. prov. Gen. Van M.
Taſte farinaceous; effects nutritious.

SEMPERVIVUM TECTORUM. *Sedi majoris folia virentia.* Roff. Auſt. prov. Brem.
Smell weak; taſte ſub-acrid, ſlightly ſtyptic; effects refrigerant, aſtringent.

SENECIO JACOBÆA. *Herba.* Van M.
Anthelmintic.

SIUM SISARUM. *Ginſeng. Radix.*
Bitter ſweet, tonic.

SEPIA OCTOPODA. *Sepiæ os.* Brem.
A carbonate of lime agglutinated by animal mucilage.

SMILAX CHINA. *Chinæ radix.* Auſt. prov. Brem.
No ſmell; taſte mucilaginous; effects ſudorific, antivenereal.

SOLANUM NIGRUM. *Herba.* Bor. Van M. Mar.
Smell nauſeous; effects diuretic, narcotic.

SPIGELIA ANTHELMIA. *Herba cum radice.* Roff. Brem.
Taſte and ſmell fetid; effects narcotic, purgative, anthelmintic.

STRYCHNOS NUX VOMICA. *Nux vomica.* Bor. Van M. La G.
No ſmell; taſte intenſely bitter; effects tonic, narcotic, deleterious.

SYMPHITUM OFFICINALE. Van M. La G. *Symphiti radix.* Roff. *Conſolida major.* Auſt. prov. Brem.
No ſmell; taſte mucilaginous; effects emollient, inſpiſſant.

TESTUDO FEROX, &c. La G.
Nutritious.

TEUCRIUM CHAMÆDRYS. *Chamædryos herba.* Roff. Auſt. prov. Brem. La G.
Smell ſlightly fragrant; taſte bitter; effects tonic, emmenagogue.

TEUCRIUM CHAMÆPITYS. *Chamæpityos herba.* Roſſ.
Smell fragrant; taſte bitter and aromatic; effects tonic.

THEOBROMA CACAO. Van M. La G. *Cacao. Nucleus. Oleum.* Roſſ. Auſt. prov. Brem. Bor.
Little ſmell; taſte pleaſant and oily, very ſlightly aſtringent and bitteriſh; effects nutritious. Oil bland, ſweetiſh; effects emollient, lubricating.

THYMUS SERPYLLUM. *Serpylli herba.* Roſſ. Auſt. prov. Brem. Bor. La G.
Smell fragrant; taſte aromatic, bitteriſh; effects ſtimulant, diuretic, emmenagogue.

THYMUS VULGARIS. *Thymi herba.* Roſſ. Brem. La G.
Smell fragrant; taſte warm, pungent, bitter; effects ſtimulant, diuretic, emmenagogue.

TILIA EUROPÆA. *Flores.* Van M. La G.
Fragrant; anodyne.

TRIFOLIUM MELILOTUS OFFICINALIS. *Meliloti herba cum floribus.* Roſſ. Auſt. prov. Brem. Bor. Van M.
Smell fragrant; taſte herbaceous, bitteriſh; effects diſcutient.

TRITICUM REPENS. Van M. La G. *Graminis radix.* Roſſ. Auſt. prov. *et* caſt. Brem. Gen. Bor.
Smell herbaceous; taſte ſweetiſh; effects aperient, demulcent.

VACCINIUM MYRTILLUS. *Myrtilli baccæ.* Roſſ. Auſt. prov.
No ſmell; taſte acidulous, ſub-aſtringent; effects refrigerant, aſtringent.

VACCINIUM OXYCOCCOS. *Oxycocci baccæ.* Roſſ.
Taſte acidulous; effects refrigerant.

VACCINIUM VITIS IDÆA. *Vitis idææ baccæ, folia.* Roſſ.
Taſte acidulous; effects refrigerant, antiſeptic.

VERATRUM SABADILLA. Van M. *Sabadillæ ſemen.* Roſſ. Auſt. prov. *et* caſt. Brem. Bor. Mar. La G.
Taſte very bitter, acrid, and cauſtic; effects ſtimulant, draſtic, cathartic, anthelmintic, errhine.

VERBASCUM THAPSIS. Van M. La G. *Verbaſci flores, folia.* Roſſ. Auſt. prov. Brem. Bor. Mar.
Taſte of the leaves herbaceous, bitteriſh; effects emollient,

diſcutient; ſmell of the flowers ſweet; taſte ſweet; effects pectoral.

VERBENA OFFICINALIS. *Folia.* La G.
Vulnerary.

VERONICA OFFICINALIS. *Folia.* Van M. La G.
Vulnerary; pectoral.

VICIA FABA. *Faba. Semen.* Auſt. prov.
Taſte farinaceous; effects nutritious.

VIOLA TRICOLOR. *Herba.* Roſſ. Auſt. prov. *Jacea. Herba.* Brem. Bor. Mar. Van M.
Smell agreeable; taſte mucilaginous, bitteriſh; effects anodyne.

VISCUM ALBUM. Bor. La G.
Glutinous; anti-paralytic; anti-epileptic; ſpecific.

VITIS VINIFERA APYRENA. *Paſſulæ minores.* Roſſ. Brem.
Taſte ſweet, acidulous, effects refrigerant, demulcent, lubricating.

No. II.

List of Animals which furniſh Articles of the Materia Medica, arranged according to Cuvier's Syſtem.

MAMMALIA.

Rodentia. Caſtor fiber.
Pachydermata. Sus ſcrofa.
Ruminantia. Moſchus moſchiferus. Cervus elaphus. Ovis aries. Bos taurus.
Cetacea. Phyſeter macrocephalus.

AVES.

Gallinæ. Phaſianus gallus.
Anseres. Anas anſer.

PISCES.

Chondropterygii. Acipenſer ſturio, ſtellatus, huſo, ruthenus.

CRUSTACEA.

Canceres. Cancer pagurus, aſtacus.

INSECTA.

Coleoptera. Lytta veſicatoria. (*Meloe veſicatorius.*) Meloe proſcarabæus.

Hymenoptera. Cyneps querci folii. Apis mellifera. Formica rufa.

Hemiptera. Coccus cacti.

Gnathaptera. Oniſcus aſellus.

MOLLUSCA.

Cephalopoda. Sepia officinalis.

Acephala. Oſtrea edulis.

VERMES.

Hirudo medicinalis.

ZOOPHYTA.

Ceratophyta. Gorgonia nobilis. (*Iſis nobilis.*)

Spongia. Spongia officinalis.

No. III.

List of the Genera of Medicinal Plants, arranged according to the Linnæan System.

Cl. I. MONANDRIA.

Ord. Monogynia.

Kæmpferia.
Curcuma.
Amomum.
Coſtus.
Maranta.
Lopezia.

Cl. II. DIANDRIA.

Ord. Monogynia.

Olea.
Veronica.
Gratiola.
Verbena.
Roſmarinus.
Salvia.

Cl. II. DIANDRIA.
Ord. Trigynia.
Piper.

Cl. III. TRIANDRIA.
Ord. Monogynia.
Valeriana.
Crocus.
Iris.
Ord. Digynia.
Saccharum.
Avena.
Secale.
Triticum.
Hordeum.

Cl. IV. TETRANDRIA.
Ord. Monogynia.
Scabioſa.
Plantago.
Penæa.
Rubia.
Fagara.
Santalum.
Alchemilla.
Dorſtenia.
Ord. Digynia.
Cuſcuta.

Cl. V. PENTANDRIA.
Ord. Monogynia.
Pulmonaria.
Symphitum.
Borago.
Cynogloſſum.
Anagallis.
Anchuſa.
Spigelia.
Menyanthes.
Convolvulus.
Datura.
Hyoſciamus.
Nicotiana.
Verbaſcum.
Chironia.

Cl. V. PENTANDRIA.
Ord. Monogynia.
Cordia.
Strychnos.
Lapſicum.
Solanum.
Phyſalis.
Atropa.
Cinchona.
Lobelia.
Pſychotria.
Cephaëlis.
Lonicera.
Rhamnus.
Vitis.
Viola.
Ribes.
Hedera.
Ord. Digynia.
Gentiana.
Chenopodium.
Ulmus.
Eryngium.
Sanicula.
Daucus.
Conium.
Sium.
Cuminum.
Ferula.
Bubon.
Angelica.
Coriandrum.
Phellandrium.
Imperatoria.
Cicuta.
Carum.
Paſtinaca.
Anethum.
Apium.
Pimpinella.
Ord. Trigynia.
Sambucus.
Rhus.
Ord. Pentagynia.
Linum.

Cl. VI. HEXANDRIA.

- Ord. Monogynia.
  - Loranthus.
  - Berberis.
  - Narciſſus.
  - Allium.
  - Aloë.
  - Convallaria.
  - Dracæna.
  - Scilla.
  - Aſparagus.
  - Lilium.
  - Acorus.
  - Calamus.
- Ord. Digynia.
  - Oryza.
- Ord. Trigynia.
  - Colchicum.
  - Rumex.

Cl. VII. HEPTANDRIA.

- Ord. Monogynia.
  - Æſculus.

Cl. VIII. OCTANDRIA.

- Ord. Monogynia.
  - Amyris.
  - Vaccinium.
  - Daphne.
- Ord. Trigynia.
  - Coccoloba.
  - Polygonum.

Cl. IX. ENNEANDRIA.

- Ord. Monogynia.
  - Laurus.
- Ord. Trigynia.
  - Rheum

Cl. X. DECANDRIA.

- Ord. Monogynia.
  - Myroxylon.
  - Toluifera.
  - Caſſia.
  - Guilandina.

C. X. DECANDRIA.

- Ord. Monogynia.
  - Dictamnus.
  - Hæmatoxylon.
  - Swietenia.
  - Guajacum.
  - Ruta.
  - Quaſſia.
  - Ledum.
  - Rhododendron.
  - Arbutus.
  - Styrax.
  - Copaifera.
- Ord. Digynia.
  - Saponaria.
  - Dianthus.
- Ord. Pentagynia.
  - Oxalis.
- Ord. Decagynia.
  - Phytolacca.

Cl. XI. DODECANDRIA.

- Ord. Monogynia.
  - Aſarum.
  - Garcinia.
  - Canella.
  - Portulaca.
  - Lythrum.
- Ord. Digynia.
  - Agrimonia.
- Ord. Trigynia.
  - Euphorbia.

Cl. XII. ICOSANDRIA.

- Ord. Monogynia.
  - Cactus.
  - Eugenia.
  - Myrtus.
  - Punica.
  - Eucalyptus.
  - Amygdalus.
  - Prunus.
- Ord. Pentagynia.
  - Pyrus.

Cl. XII. ICOSANDRIA.

- Ord. Polygynia.
  - Roſa.
  - Rubus.
  - Tormentilla.
  - Fragaria.
  - Potentilla.
  - Geum.

Cl. XIII. POLYANDRIA.

- Ord. Monogynia.
  - Papaver.
  - Chelidonium.
  - Ciſtus.
  - Tilea.
  - Nymphæa.
- Ord. Digynia.
  - Pæonia.
- Ord. Trigynia.
  - Delphinium.
  - Aconitum.
- Ord. Tetragynia.
  - Wintera.
- Ord. Pentagynia.
  - Nigella.
- Ord. Polygynia.
  - Clematis.
  - Helleborus.

Cl. XIV. DIDYNAMIA.

- Ord. Gymnospermia.
  - Glecoma.
  - Hyſſopus.
  - Mentha.
  - Lavandula.
  - Teucrium.
  - Lamium.
  - Satureja.
  - Marrubium.
  - Thymus.
  - Ocimum.
  - Origanum.
  - Meliſſa.
- Ord. Angiospermia.
  - Euphraſia.
  - Scrophularia.
  - Digitalis.

Cl. XV. TETRADYNAMIA.

- Ord. Siliculosæ.
  - Cochlearia.
  - Lepidium.
  - Raphanus.
  - Cardamine.
  - Sinapis.
  - Siſymbrium.

Cl. XVI. MONADELPHIA.

- Ord. Triandria.
  - Tamarindus.
- Ord. Polyandria.
  - Malva.
  - Althæa.

Cl. XVII. DIADELPHIA.

- Ord. Hexandria.
  - Fumaria.
- Ord. Octandria.
  - Polygala.
- Ord. Decandria.
  - Pterocarpus.
  - Spartium.
  - Geniſta.
  - Lupinus.
  - Dolichos.
  - Aſtragalus.
  - Trifolium.
  - Glycyrrhiza.
  - Geoffroya.
  - Trigonella.

Cl. XVIII. POLYADELPHIA.

- Ord. Decandria.
  - Theobroma.
- Ord. Icosandria.
  - Citrus.
- Ord. Polyandria.
  - Melaleuca.
  - Hypericum.

Cl. XIX. SYNGENESIA.

- Ord. Polygamia Æqualis.
  - Cichoreum.
  - Scorzonera.

Cl. XIX. SYNGENESIA.

Ord. Polygamia Æqualis.
- Leontodon.
- Lactuca.
- Carlina.
- Arctium.
- Carthamus.
- Cynara.
- Carduus.

O. Polygamia Superflua.
- Artemiſia.
- Tanacetum.
- Bellis.
- Matricaria.
- Arnica.
- Inula.
- Solidago.
- Senecio.
- Tuſſilago.
- Anthemis.
- Achillea.

O. Polygamia Frustranea.
- Centaurea.

O. Polygamia Necissaria.
- Calendula.

Cl. XX. GYNANDRIA.

Ord. Diandria.
- Orchis.
- Epidendrum.

Ord. Hexandria.
- Ariſtolochia.

Ord. Dodecandria.
- Cytinus.

Ord. Polyandria.
- Arum.

Cl. XXI. MONOECIA.

Ord. Tetrandria.
- Betula.
- Morus.
- Urtica.

Ord. Polyandria.
- Quercus.
- Juglans.
- Liquidamber.

Ord. Monadelphia.
- Pinus.

Cl. XXI. MONOECIA.

Ord. Monadelphia.
- Ricinus.
- Croton.

Ord. Syngenesia.
- Momordica.
- Cucumis.
- Cucurbita.
- Bryonia.

Cl. XXII. DIOECIA.

Ord. Diandria.
- Salix.

Ord. Tetrandria.
- Viſcum.

Ord. Pentandria.
- Piſtacia.
- Cannabis.
- Humulus.

Ord. Hexandria.
- Smilax.

Ord. Octandria.
- Populus.

Ord. Monadelphia.
- Juniperus.
- Ciſſampelos.

Cl. XXIII. POLYGAMIA.

Ord. Monoecia.
- Veratum.
- Mimoſa.
- Parietaria.

Ord. Dioecia.
- Fraxinus.
- Panax.

Ord. Trioecia.
- Ficus.
- Ceratonia.

Cl. XXIV. CRYPTOGAMIA.

Ord. Filices.
- Polypodium.
- Adiantum.

Ord. Musci.
- Lycopodium.

Ord. Algæ.
- Lichen.
- Conferva.

Cl. XXIV. CRYPTOGAMIA.
  Ord. Fungi.
    Agaricus.
    Boletus.
    Lycoperdon.

Cl. XXV. PALMÆ.
  Cocos.
  Phœnix.
  Sagus.

List of Officinal Genera, arranged according to the Natural System of Juſsieu, improved by Ventenat.

Cl. I. ACOTYLEDONES.

Ord. 1. Fungi.
  Lycoperdon.
  Boletus.
  Agaricus.
2. Algæ.
  Conferva.
  Lichen.
  Plataphyllum.

Ord. 3. Hepaticæ.
4. Musci.
  Lycopodium.
5. Filices.
  Polypodium.
  Pteris.
  Adiantum.
  Cycas.

MONOCOTYLEDONES.

Cl. II. *Stamina hypogynia.*
  1. Pluviales.
  2. Aroideæ.
    Arum.
    Acorus.
  3. Typhoideæ.
  4. Cyperoideæ.
  5. Gramineæ.
    Saccharum.
    Lolium.
    Hordeum.
    Triticum.
    Secale.
    Avena.
    Oryza.

Ord. 2. Asparagoideæ.
  Dracæna.
  Aſparagus.
  Convallaria.
3. Smilaceæ.
  Smilax.
4. Ioncaceæ.
  Veratrum.
  Colchicum.
5. Alismoideæ.
6. Liliaceæ.
  a. Aſphodeloideæ.
    Scilla.
    Allium.
  b. Glorioſæ.
    Lilium.
  c. Aloideæ.
    Aloë.
7. Narciſsoideæ.
  Narciſſus.
8. Irideæ.
  Iris.
  Crocus.

III. *Perigynia.*
  1. Palmæ.
    Calamus.
    Areca.
    Cocos.
    Sagus.
    Phœnix.

MONOCOTYLEDONES.

Cl. IV. *Epigynia.*
Ord. 1. SCITAMINEÆ.
2. DRYMYRRHIZÆ.
Amomum.
Kæmpferia.

Cl. IV. *Epigynia.*
Ord. 3. ORCHIDEÆ.
Orchis.
Vanilla.
4. HYDROCHARIDEÆ.

DICOTYLEDONES.

A. *Flores apetali.*

Cl. V. *Epigynia.*
Ord. 1. ASAROIDEÆ.
Ariſtolochia.
Aſarum.
Cytinus.

VI. *Perigynia.*
1. ELÆAGNOIDEÆ.
2. DAPHNOIDEÆ.
Daphne.
3. PROTEOIDEÆ.
4. LAURINEÆ.
Laurus.
Myriſtica.
5. POLYGONEÆ.
Coccoloba.
Polygonum.

Cl. VI. *Perigynia.*
Ord. 5. POLYGONEÆ.
Rumex.
Rheum.
6. CHENOPODEÆ.
Phytolacca.
Chenopodium.

VII. *Hypogynia.*
1. AMARANTHOIDEÆ.
2. PLANTAGINEÆ.
Plantago.
Pſyllium.
3. NYCTAGINEÆ.
Mirabilis.
4. PLUMBAGINEÆ.

B. *Monopetali.*

Cl. VIII. *Hypegynia.*
Ord. 1. PRIMULACEÆ.
2. OROBANCHOIDEÆ.
3. RHINANTHOIDEÆ.
Polygala.
Veronica.
4. ACANTHOIDEÆ.
5. LILACEÆ.
Fraxinus.
6. IASMINEÆ.
Olea.
7. PYRENACEÆ.
8. LABIATÆ.
Roſmarinus.
Salvia.
Teucrium.
Hyſſopus.
Lavandula.

Cl. VIII. *Hypogynia.*
Ord. 8. LABIATÆ.
Mentha.
Glecoma.
Marrubium.
Origanum.
Thymus.
Meliſſa.
Ocimum.
9. PERSONATÆ.
Digitalis.
Gratiola.
10. SOLANEÆ.
Hyoſciamus.
Nicotiana.
Datura.
Atropa.
Solanum.

DICOTYLEDONES.
B. *Monopetali.*

Cl. VIII. *Hypogynia.*
Ord. 10. SOLANEÆ.
Capſicum.
11. SEBESTENÆ.
Cordia.
12. BORRAGINEÆ.
Anchuſa.
13. CONVOLVULACEÆ.
Convolvulus.
14. POLEMONACEÆ.
15. BIGNONEÆ.
16. GENTIANEÆ.
Menyanthes.
Gentiana.
Chironia.
Spigelia.
17. APOCINEÆ.
Aſclepias.
18. HILOSPERMÆ.

IX. *Perigynia.*
1. EBENACEÆ.
Styrax.
2. RHODORACEÆ.
Rhododendron.
Ledum.
3. BICORNES.
Arbutus.
Vaccinium.
4. CAMPANULACEÆ.
Lobelia.

X. *Epigynia*, with united antheræ.
1. CICHORACEÆ.
Lactuca.
Taraxacum.

Cl. X. *Epigynia*, with united antheræ.
Ord. 1. CICHORACEÆ.
Cichorium.
Scolymus.
2. CINAROCEPHALÆ.
Cinara.
Arctium.
Centaurea.
3. CORYMBIFERÆ.
Anthemis.
Achillea.
Solidago.
Inula.
Tuſſilago.
Arnica.
Matricaria.
Tanacetum.
Artemiſia.
Abſinthium.

XI. *Epigynia*, with diſtinct antheræ.
1. DIPSACEÆ.
Valeriana.
2. RUBIACEÆ.
Galium.
Rubia.
Cinchona.
Pſychotria.
Coffea.
3. CAPRIFOLIACEÆ.
Diervilla.
Sambucus.
Cornus.
Hedera.

DICOTYLEDONES.
C. *Polypetali.*

Cl. XII. *Epigynia.*
Ord. 1. ARALIACEÆ.
Panax.
2. UMBELLIFERÆ.

Cl. XII. *Epigynia.*
Ord. 2. UMBELLIFERÆ.
Pimpinella.
Carum.

DICOTYLEDONES.

C. *Polypetali.*

Cl. XII. *Epigynia.*

- Ord. 2. Umbelliferæ.
  - Apium.
  - Anethum.
  - Paſtinaca.
  - Imperatoria.
  - Scandix.
  - Coriandrum.
  - Phellandrium.
  - Cuminum.
  - Bubon.
  - Sium.
  - Angelica.
  - Liguſticum.
  - Ferula.
  - Cicuta.
  - Daucus.
  - Eryngium.

XIII. *Hypogynia.*

- 1. Ranunculaceæ.
  - Clematis.
  - Helleborus.
  - Delphinium.
  - Aconitum.
- 2. Tulipiferæ.
  - Illicium.
- 3. Glyptospermæ.
- 4. Menispermoideæ.
- 5. Berberideæ.
  - Berberis.
- 6. Papaveraceæ.
  - Papaver.
  - Chalidonium.
  - Fumaria.
- 7. Cruciferæ.
  - Raphanus.
  - Sinapis.
  - Siſymbrium.
  - Cardamine.
  - Cochlearia.
  - Naſturtium.
- 8. Capparideæ.
- 9. Saponaceæ.

Cl. XIII. *Hypogynia.*

- Ord. 10. Malpighiaceæ.
  - Hippocaſtanum.
- 11. Hypericoideæ.
  - Hypericum.
- 12. Guttiferæ.
  - Mangoſtana.
- 13. Hesperideæ.
  - Citrus.
- 14. Meliaceæ.
  - Canella.
  - Swietenia.
- 15. Sarmentaceæ.
  - Vitis.
- 16. Geranioideæ.
  - Oxalis.
- 17. Malvaceæ.
  - Malva.
  - Althœa.
  - Hibiſcus.
  - Theobroma.
- 18. Tiliaceæ.
  - Tilia.
- 19. Cistoideæ.
  - Ciſtus.
  - Viola.
- 20. Rutaceæ.
  - Guaiacum.
  - Ruta.
  - Dictamnus.
- 21. Caryophylleæ.
  - Dianthus.
  - Linum.

Cl. XIV. *Perigynia.*

- 1. Portulaceæ.
- 2. Ficoideæ.
- 3. Succulentæ.
  - Sedum.
- 4. Saxifrageæ.
  - Ribes.
- 5. Cactoideæ.
  - Cactus.

DICOTYLEDONES.

C. *Polypetali.*

- Cl. XIV. *Perigynia.*
  - Ord. 6. MELASTOMEÆ.
  - 7. CALYCANTHEMÆ.
  - 8. EPILOBIANÆ.
  - 9. MYRTOIDEÆ.
    - Eucalyptus.
    - Melaleuca.
    - Myrtus.
    - Eugenia.
    - Caryophyllus.
    - Punica.
  - 10. ROSACEÆ.
    - Malus.
    - Pyrus.
    - Cydonia.
    - Roſa.
    - Alchimilla.
    - Tormentilla.
    - Potentilla.
    - Geum.
    - Rubus.
    - Ceraſus.
    - Prunus.
    - Amygdalus.
  - 11. LEGUMINOSÆ.
    - Mimoſa.
    - Tamarindus.

- Cl. XIV. *Perigynia.*
  - Ord. 11. LEGUMINOSÆ.
    - Caſſia.
    - Moringa.
    - Hæmatoxylum.
    - Spartium.
    - Geniſta.
    - Trigonella.
    - Lupinus.
    - Melilotus.
    - Dolichos.
    - Aſtragalus.
    - Glycyrrhiza.
    - Dalbergia.
    - Geoffræa.
    - Pterocarpus.
    - Copaifera.
  - 12. TEREBINTACEÆ.
    - Rhus.
    - Amyris.
    - Terebinthus.
    - Burſera.
    - Toluifera.
    - Fagara.
    - Juglans.
  - 13. RHAMNOIDEÆ.
    - Rhamnus.

DICOTYLEDONES.

D. *Apetali.*

- Cl. XV. *Idiogynia.*
  - Ord. 1. TITHYMALOIDEÆ.
    - Euphorbia.
    - Clutia.
    - Ricinus.
    - Croton.
  - 2. CUCURBITACEÆ.
    - Bryonia.
    - Elaterium.
    - Momordica.
    - Cucumis.
    - Cucurbita.
  - 3. URTICEÆ.
    - Ficus.
    - Dorſtenia.
    - Urtica.
    - Parietaria.

- Cl. XV. *Idiogynia.*
  - Ord. 3. URTICEÆ.
    - Humulus.
    - Piper.
    - Morus.
  - 4. AMENTACEÆ.
    - Ulmus.
    - Salix.
    - Populus.
    - Betula.
    - Quercus.
    - Liquidamber.
  - 5. CONIFERÆ.
    - Juniperus.
    - Abies.
    - Pinus.

No. V.

List of Subſtances belonging to the Mineral Kingdom, *which are used in Medicine.*

EARTHS.

Lime.

Carbonate of lime.
  Chalk.
  Marble.

Baryta.

Carbonate of baryta.
Sulphate of baryta.

Alumina.

Bole.

SALTS.

Sulphate of magneſia.
Super-ſulphate of alumina and potaſs.
Sulphate of iron.
  of copper.
Sulphate of zinc.

SALTS.

Nitrate of potaſs.
Muriate of ſoda.

INFLAMMABLES.

Bitumen.
Amber.
Sulphur.

METALS.

Silver.
Copper.
Iron.
Tin.
Lead.
Mercury.
Zinc.
Antimony.
Arſenic.

PART III.

PREPARATIONS AND COMPOSITIONS.

CHAP I.

SULPHUR.

SULPHUR SUBLIMATUM LOTUM. *Edin.*

FLORES SULPHURIS LOTI. *Lond.*

Waſhed Sublimed Sulphur. Waſhed Flowers of Sulphur.

ke

Sublimed ſulphur, one pound;
Water, four pounds.

Boil the ſulphur for a little in the water, then pour off this water, and waſh away all the acid by affuſions of cold water; and laſtly, dry the ſulphur.

SULPHUR SUBLIMATUM LOTUM. *Dub.*

Waſhed Sublimed Sulphur.

Let warm water be poured upon ſublimed ſulphur, and the waſhing be repeated as long as the water, when poured off, is impregnated with acid.

When dried, it is to be kept in well-cloſed veſſels.

As it is impoſſible to ſublime ſulphur in veſſels perfectly void of air, a ſmall portion of it is always acidified and converted into ſulphurous or ſulphuric acid. The preſence of acid in ſulphur, is always to be conſidered as an impurity, and muſt be removed by careful ablution. When thoroughly waſhed, ſublimed ſulphur is not acted upon by the atmoſphere; there is therefore no particular reaſon for preſerving it from the action of the air; for if, on keeping, it become moiſt, it is becauſe the ſulphuric acid has not been entirely waſhed away.

Off. prep.—Trochiſci. *Lond.*

ULPHUR PRÆCIPITATUM. *Lond.*

Precipitated Sulphur.

Take of

Sulphuretted kali, ſix ounces;
Diſtilled water, one pound and an half;
Diluted vitriolic acid, as much as is ſufficient.

Boil the ſulphuretted kali in the diſtilled water until it be diſſolved. Filter the liquor through paper, to which add the diluted vitriolic acid. Waſh the precipitated powder by repeated affuſions of water till it become inſipid.

Dub.

Take of
Sulphuretted vegetable alkali, four ounces;
Boiling water, a pound and a half;
Diluted nitrous acid, as much as may be ſufficient.

Diſſolve the ſulphuretted vegetable alkali in the water, and add the acid to the filtered liquor as long as the liquor is rendered turbid by its addition. Waſh the precipitated powder well with warm water, and keep it after it is dried in well-cloſed veſſels.

Instead of diſſolving ſulphuret of potaſs in water, we may gradually add ſublimed ſulphur to a boiling ſolution of potaſs, until it be ſaturated. When the ſulphuretted potaſs is thrown into water, it is entirely diſſolved, but not without decompoſition, for it is converted into ſulphate of potaſs, hydroguretted ſulphuret of potaſs, and ſulphuretted hydroguret of potaſs. The two laſt compounds are again decompoſed on the addition of any acid. The acid combines with the potaſs, ſulphuretted hydrogen flies off in the form of gas, while ſulphur is precipitated. It is of little conſequence what acid is employed to precipitate the ſulphur. The London college order the ſulphuric; while the Dublin college uſe nitrous acid, probably becauſe the nitrate of potaſs formed, is more eaſily waſhed away than ſulphate of potaſs.

Precipitated ſulphur does not differ from well-waſhed ſublimed ſulphur, except in being much dearer. Its paler colour is owing to its more minute diviſion, or according to Dr. Thomſon, to the preſence of a little water; but from either circumſtance it derives no ſuperiority to compenſate for the diſagreeableneſs of its preparation.

CHAP II.

A C I D S.

ACIDUM SULPHURICUM DILUTUM. *Edin.*
Diluted Sulphuric Acid.

Take of
Sulphuric acid, one part;
Water, ſeven parts.

Mix them.

ACIDUM VITRIOLICUM DILUTUM. *Lond.*
Diluted or weak Vitriolic Acid.

Take of
Vitriolic acid, one ounce;
Diſtilled water, eight ounces.
Mix them by degrees.

Dub.

Take of
Vitriolic acid, two ounces;
Diſtilled water, fourteen ounces.
Having gradually mixed them, ſet them aſide to cool, and then pour off the clear liquor.

THE moſt ſimple form in which ſulphuric acid can be advantageouſly employed internally, is that in which it is merely diluted with water: and it is highly proper that there ſhould be ſome fixed ſtandard in which the acid in this ſtate ſhould be kept. It is, however, much to be regretted, that the colleges have not adopted the ſame ſtandard with reſpect to ſtrength: For in the Edinburgh and Dublin colleges, the ſtrong acid conſtitutes an eighth; and in the London, only a ninth of the mixture. The former proportion ſeems preferable, as it gives exactly a drachm of acid to the ounce; but the dilution by means of diſtilled water is preferable to ſpring water; which, even in its pureſt ſtate, is not free from impregnations affecting the acid. Even when diſtilled water is uſed, there is often a ſmall quantity of a white precipitate, ariſing from lead diſſolved in the acid.

Sulphuric acid has a very ſtrong attraction for water; and their bulk when combined is leſs than that of the water and acid ſeparately. At the ſame time, there is a very conſiderable increaſe of temperature produced, which is apt to crack glaſs veſſels, unleſs the combination be very cautiouſly made; and for the ſame reaſon, the acid muſt be poured into the water, not the water into the acid.

ACIDUM NITROSUM. *Edin.*
Nitrous Acid.

Take of
Very pure nitrate of potaſs, two pounds;
Sulphuric acid, ſixteen ounces.
Having put the nitrate of potaſs into a glaſs retort, pour upon it the ſulphuric acid, and diſtil in a ſand bath, with a heat gradually increaſed, until the iron pot begins to be red-hot.
The ſpecific gravity of this acid is to that of diſtilled water as 1550 to 1000.

Lond.

Take of
Purified nitre, by weight, ſixty ounces;

Vitriolic acid, by weight, twenty-nine ounces.

Mix and diſtil.

The ſpecific gravity of this is to the weight of diſtilled water as 1550 to 1000.

Dub.

Take of

Nitre, ſix pounds;

Vitriolic acid, three pounds.

Mix and diſtil, until the reſiduum becomes dry.

The ſpecific gravity of the acid is to the weight of diſtilled water as 1550 to 1000.

In this proceſs, the ſulphuric acid, by its ſuperior affinity, combines with the potaſs of the nitre to form ſulphate of potaſs, while the nitric acid is ſeparated, and is not only converted into vapour by the application of the heat to the retort, but is alſo partially decompoſed. A portion of oxygen eſcapes in a gaſeous form, and the nitric oxide gas combines with the nitric acid; ſo that the liquor condenſed in the receiver is nitrous and not nitric acid.

In performing this proceſs, we muſt take care, in pouring in the ſulphuric acid, not to ſoil the neck of the retort. Inſtead of a common receiver, it is of advantage to uſe ſome modification of Woulfe's apparatus, and as the vapours are extremely corroſive, the fat lute muſt be uſed to connect the retort with it. The difference of the proportions of the ingredients directed by the different colleges, has no effect on the quality of the acid obtained, but only affects the reſiduum. The London and Dublin colleges uſe no more ſulphuric acid than what is neceſſary to expel all the nitric acid, and the reſiduum is a neutral ſulphate of potaſs, ſo inſoluble, that it cannot be got out without breaking the retort. The Edinburgh college order as much ſulphuric acid as renders the reſiduum, an acidulous ſulphate of potaſs, eaſily ſoluble in water.

Nitrous acid is frequently impure. Sulphuric acid is eaſily got rid of by re-diſtilling the nitrous acid from a ſmall quantity of nitrate of potaſs. But its preſence is not indicated when nitrous acid forms a precipitate with nitrate of baryta, as affirmed by almoſt all chemical authors; for nitrate of baryta was diſcovered by Mr. Hume to be inſoluble in nitrous acid.

Muriatic acid is detected by the precipitate formed with nitrate of ſilver, and may be ſeparated by dropping into the nitrous acid a ſolution of nitrate of ſilver, as long as it forms any precipitate, and drawing off the nitrous acid by diſtillation.

The general properties of nitrous acid have been already noticed. Mr. Davy has ſhewn that it is a compound of nitric acid and nitric oxide, and that by additional doſes of the laſt conſtituent, its colour is ſucceſſively changed, from yellow to orange, olive green, and blue green, and its ſpecific gravity is diminiſhed. The ſpecific gravity is probably ſtated too high by the colleges; for although Rouelle makes that of the ſtrongeſt nitric acid 1.583, yet Kirwan could produce it no ſtronger at 60° than 1.5543, and Mr. Davy makes it only 1.504, and when ſaturated with nitric oxide only 1.475.

Off. prep.—Spiritus æth. nitroſ. *Ed. Lond. Dub.*

ACIDUM NITROSUM DILUTUM. *Lond. Dub. Ed.*

Diluted Nitrous Acid.

Take of
Nitrous acid,
Water, equal weights.
Mix them, taking care to avoid the noxious vapours.

Nitrous acid has a great affinity for water, and attracts it from the atmoſphere. During their combination there is an increaſe of temperature, part of the nitric oxide is diſſipated in the form of noxious vapours, and the colour changes ſucceſſively from orange to green, and to blue, according as the proportion of water is increaſed. A mixture of equal parts of Kirwan's ſtandard acid of 1.5543 and water, has the ſpecific gravity 1.1911.

Off. prep.—Sulph. præc. *Dub.* Nitras argenti, *Ed. Lond. Dub.* Acetis hyd. *Ed. Lond. Dub.* Sub-murias hydrarg. præcip. *Ed. Lond. Dub.* Oxid. hyd. cin. *Ed. Dub.* Oxidum hyd. rubr. per acid. nitric. *Ed. Lond. Dub.*

ACIDUM NITRICUM. *Ed.*

Nitric acid.

Take of
Nitrous acid, any quantity.
Pour it into a retort, and having adapted a receiver, apply a very gentle heat, until the reddeſt portion ſhall have paſſed over, and the acid which remains in the retort ſhall have become nitric acid.

We have already ſtated, that nitrous acid is nitric acid combined with a variable proportion of nitric oxide. Now, by the application of a gentle heat, the whole of the nitric oxide is vaporized, and pure colourleſs nitric acid remains in the retort. The nitric oxide, however, carries over with it a portion of the acid, and condenſes with it in the receiver, in the form of a very high-coloured nitrous acid.

Richter has given the following manner of preparing nitric acid.

Take of
- Purified nitrate of potaſs, ſeven pounds;
- Black oxide of manganeſe, one pound two ounces;
- Sulphuric acid, four pounds, four ounces, and ſix drachms.

Into a retort capable of containing twenty-four pounds, introduce the nitre and manganeſe, powdered and mixed, and pour upon them gradually, through a retort-funnel, the ſulphuric acid. Lute on the receiver with flour and water, and conduct the diſtillation with a gradually-increaſed heat.

From theſe proportions, Richter got three pounds nine ounces of very ſlightly-coloured nitric acid. The operation will be conducted with leſs hazard in a Woulfe's apparatus, or by interpoſing between the retort and a receiver a tubulated adopter, furniſhed with a bent tube, of which the further extremity is immerſed in a veſſel containing a ſmall quantity of water.

THESE acids, the nitrous and nitric, have been long employed as powerful pharmaceutic agents. Their application in this way we ſhall have many opportunities of illuſtrating.

Medical uſe.—Lately, however, their uſe in medicine has been conſiderably extended. In the ſtate of vapour they have been uſed to deſtroy contagion in jails, hoſpitals, ſhips, and other places where the accumulation of animal effluvia is not eaſily avoided. The fumigating ſuch places with the vapour of nitrous acid has certainly been attended with ſucceſs; but we have heard that ſucceſs aſcribed entirely to the ventilation employed at the ſame time. Ventilation may certainly be carried ſo far, that the contagious miaſmata may be diluted to ſuch a degree that they ſhall not act on the body; but to us it appears no leſs certain, that theſe miaſmata cannot come in contact with nitric acid or oxy-muriatic acid vapour, without being entirely decompoſed and completely deſtroyed. It is, beſides, applicable in ſituations which do not admit of ſufficient ventilation; and where it is, the previous diffuſion of acid vapours is an excellent check upon the indolence and inattention of ſervants and nurſes, as by the ſmell we are enabled to judge whether they have been ſufficiently attentive to the ſucceeding ventilation. Nitric acid vapour, alſo, is not deleterious to life, and may be diffuſed in the apartments of the ſick, without occaſioning to them any material inconvenience. The means of diffuſing it are eaſy. Half an ounce of powdered nitre is put into a ſaucer, which is placed in a pipkin of heated ſand. On the nitre two drachms of ſulphuric acid are then poured. The fumes of nitric acid immediately begin to riſe. This quantity will fill with vapour a cube of ten feet; and by employing a ſufficient number of pipkins, the fumes may be eaſily made to fill a ward of any extent. After the fumigation, ventilation is to be carefully employed. For introducing this practice, Dr. Carmichael Smyth has received from the Britiſh parliament a reward of five thouſand pounds.

The internal uſe of theſe acids has alſo been lately much extended. In febrile diſeaſes, water acidulated with them forms one of the beſt antiphlogiſtic and antiſeptic drinks we are acquainted with. Hoffmann and Eberhard long ago employed it with very great ſucceſs in malignant and petechial fevers; and in the low typhus, which frequently rages among the poor in the ſuburbs of Edinburgh, I have repeatedly given it with unequivocal advantage. In the liver complaint of the Eaſt-Indies, and in ſyphilis, nitric acid has alſo been extolled as a valuable remedy by Dr. Scott, and the evident benefits reſulting from its uſe in theſe complaints, has given riſe to a theory, that mercury only acts by oxygenizing the ſyſtem. It is certain that both the primary and ſecondary ſymptoms of ſyphilis have been removed by the uſe of theſe acids, and that the former ſymptoms have not returned, or been followed by any ſecondary ſymptoms. But in many inſtances they have failed, and it is doubtful if ever they effected a permanent cure, after the ſecondary ſymptoms appeared. Upon the whole, the opinions of Mr. Pearſon on this ſubject, lately agitated with ſo much keenneſs, appear to us ſo candid and judicious, that we ſhall inſert them here. He does not think it eligible to rely on the nitrous acid in the treatment of any one form of the lues venerea; at the ſame time, he by no means wiſhes to ſee it exploded as a medicine altogether uſeleſs in that diſeaſe. When an impaired ſtate of the conſtitution renders the introduction of mercury into the ſyſtem inconvenient, or evidently improper, the nitrous acid will be found, he thinks, capable of reſtraining the progreſs of the diſeaſe, while at the ſame time, it will improve the health and ſtrength of the patient. On ſome occaſions, this acid may be given in conjunction with a mercurial courſe, and it will be found to ſupport the tone of the ſtomach, to determine powerfully to the kidneys, and to counteract in no inconſiderable degree the effects of mercury on the mouth and fauces.

ACIDUM MURIATICUM. *Edin.*
Muriatic Acid.

Take of
  Muriate of ſoda, two pounds;
  Sulphuric acid, ſixteen ounces;
  Water, one pound.

Heat the muriate of ſoda for ſome time red-hot in a pot, and after it has cooled, put it into a retort. Then pour upon the muriate of ſoda the acid mixed with the water and allowed to cool. Laſtly, diſtil in a ſand bath, with a moderate fire, as long as any acid is produced.

The ſpecific gravity of this acid is to that of diſtilled water as 1170 to 1000.

Lond.

Take of
Dried ſea-ſalt, ten pounds;
Vitriolic acid, ſix pounds;
Water, five pounds.
Add by degrees the vitriolic acid, firſt mixed with the water, to the ſalt; then diſtil.

The ſpecific gravity of this acid is to that of diſtilled water as 1170 to 1000.

Dub.

Take of
Common ſalt, dried, five pounds;
Vitriolic acid,
Water, each three pounds.
Add the acid, diluted with the water, after it has cooled, gradually to the ſalt, and then diſtil the liquor, until the reſiduum become dry.

The ſpecific gravity of this acid is to that of diſtilled water, as 1160 to 1000.

In this proceſs the muriate of ſoda is decompoſed, and the muriatic acid diſengaged by the ſuperior affinity of the ſulphuric acid. But as muriatic acid is a permanently-elaſtic fluid, the addition of the water is abſolutely neceſſary for its exiſtence in a fluid form. Some operators put a portion of water into the receiver, for the purpoſe of abſorbing the muriatic acid gas, which is firſt diſengaged; the colleges, however, order the whole of the water to be previouſly mixed with the ſulphuric acid. This mixture muſt not be made in the retort itſelf; for the heat produced is ſo great, that it would not only endanger the breaking of the veſſel, but occaſion conſiderable loſs and inconvenience by the ſudden diſengagement of muriatic gas.

The muriate of ſoda is directed to be heated to redneſs before it be introduced into the retort, that the whole of the water of cryſtallization may be expelled, which being variable in quantity, would otherwiſe affect the ſtrength of the acid produced; and beſides, without this precaution, the acid obtained is too high-coloured.

Mr. Accum has ſaid, that the quantity of ſulphuric acid preſcribed by the London college for obtaining this acid is much too large, and that the proportion of ſulphuric acid preſcribed for preparing the nitric acid is much too ſmall; but in neither criticiſm is he correct.

If a common retort and receiver be employed for this diſtillation, they muſt not be luted perfectly cloſely; for if any portion of the gas ſhould not be abſorbed by the water employed, it muſt be allowed to eſcape; but the proceſs will be performed with greater economy, and perfect ſafety, in a Woulfe's, or ſome ſimilar apparatus.

The reſiduum in the retort conſiſts principally of ſulphate of ſoda, which may be purified by ſolution and cryſtallization.

If properly prepared, the muriatic acid is perfectly colourleſs, and poſſeſſes the other properties already enumerated; but in the ſhops it is very ſeldom found pure. It almoſt always contains iron, and very frequently ſulphuric acid or copper. The copper is detected by the blue colour produced by ſuper-ſaturating the acid with ammonia, the iron by the black or blue precipitate formed with tincture of galls or pruſſiate of potaſs. The ſulphuric acid may be eaſily got rid of by re-diſtilling the acid from a ſmall quantity of dried muriate of ſoda. But Mr. Hume diſcovered that muriate of baryta is precipitated when poured into muriatic acid, although it contain no ſulphuric acid.

Medical uſe.—In its effects on the animal economy, and the mode of its employment, it coincides with the acids already mentioned, which almoſt proves that they do not act by oxygenizing the ſyſtem, as the muriatic acid cannot be diſoxygenized by any ſubſtance or proceſs with which we are acquainted.

Off. prep.—Sulphas ſodæ, *Ed. Lond. Dub.* Hydro-ſulph. ammon. *Ed.* Murias barytæ, *Ed.* Solutio muriat. calcis, *Ed.*

Oxygenized Muriatic Acid.

The vapours of this powerfully-oxygenizing acid have been recommended by Morveau as the beſt means of deſtroying contagion. As, however, they are deleterious to animal life, they cannot be employed in every ſituation. Where applicable, they are eaſily diſengaged by mixing together ten parts of muriate of ſoda, and two parts of black oxide of mangaueſe in powder, and pouring upon the mixture firſt four parts of water, and then ſix parts of ſulphuric acid. Fumes of oxygenized muriatic acid are immediately diſengaged.

Morveau has ſince contrived what he calls Diſ-infecting or Preſervative phials. If intended to be portable, 46 grains of black oxide of mangaueſe in coarſe powder are to be put into a ſtrong glaſs phial of about 2^3 cubic inches capacity, with an accurately-ground ſtopper, to which muſt be added about $\frac{45}{100}$ of a cubic inch of nitric acid of 1.4 ſpecific gravity, and an equal bulk of muriatic acid of 1.134, the ſtopper is then to be replaced, and the whole ſecured by incloſing the phial in a ſtrong wooden caſe, with a cap which ſcrews down ſo as to keep the ſtopper in its place. They are to be uſed by ſimply opening the phial without approaching it to the noſe, and ſhutting it as ſoon as the ſmell of the muriatic gas is perceived. A phial of this kind, if properly prepared, will not loſe its power after many years uſe. For ~~ſmall~~ wards, ſtrong bottles, with ground ſtoppers an inch in diameter, of about 25 or 27 cubic inches of capacity, may be uſed, with 372 grains of the oxide, and 3.5 inches of each of the acids, and the ſtopper kept in its place by leaden weights; or for larger wards, very ſtrong glaſs jars, about 43 cubic inches in capacity, containing a drachm of the oxide, and 6 inches of each of the acids. Theſe jars are to be covered with a plate of glaſs, adjuſted to them by grinding with emery, and kept in its place by a ſcrew. In no caſe is the mixture to occupy more than one third of the veſſel.

ACIDUM ACETOSUM DESTILLATUM. *Ed.*

Diſtilled Acetous Acid.

Let eight pounds of acetous acid be diſtilled in glaſs-veſſels, with a gentle heat. The two firſt pounds which come over, being too watery, are to be ſet aſide; the next four pounds will be the diſtilled acetous acid. The remainder furniſhes a ſtill ſtronger acid, but too much burnt by the fire.

ACETUM DESTILLATUM. *Dub.*

Diſtilled Vinegar.

Take of
Vinegar, ten pounds.
Draw off, with a gentle heat, ſix pounds.
The ſpecific gravity of this acid is to the weight of diſtilled water as 1004 to 1000.

Lond.

Take of
Vinegar, five pounds.
Diſtil with a gentle fire, in glaſs veſſels, ſo long as the drops fall free from empyreuma.

VINEGAR, when prepared from vinous liquors by fermentation, beſides acetous acid and water, contains extractive, ſuper-tartrate of potaſs, and often citric or malic acid, alcohol, and a peculiar agreeable aroma. Theſe ſubſtances, particularly the extractive and ſuper-tartrate of potaſs, render it apt to ſpoil, and unfit for pharmaceutic and chemical purpoſes. By diſtillation, however, the acetic acid is eaſily ſeparated from ſuch of theſe ſubſtances as are not volatile. But by diſtillation it loſes its agreeable flavour, and becomes conſiderably weaker; for the water being rather more volatile than acetic acid, comes over firſt, while the laſt and ſtrongeſt portion of the acid cannot be obtained free from empyreuma.

This proceſs may be performed either in a common ſtill or rather in a retort. The better kinds of wine-vinegar ſhould be uſed. Indeed, with the beſt kind of vinegar, if the diſtillation be carried on to any great length, it is extremely difficult to avoid empyreuma. The beſt method of preventing this inconvenience is, if a retort be uſed, to place the ſand but a little way up its ſides, and when ſomewhat more than half the liquor is come over, to pour on the remainder a quantity of freſh vinegar equal to the liquor drawn off. This may be repeated three or four times; the vinegar ſupplied at each time being previouſly heated. The addition of cold liquor would not only prolong the operation, but alſo endanger the breaking of the retort.

Lowitz recommends the addition of half an ounce of recently-burnt and powdered charcoal to each pound of vinegar in the ſtill, as the beſt means of avoiding empyreuma.

If the common ſtill be employed, it ſhould likewiſe be occaſionally ſupplied with freſh vinegar, in proportion as the acid runs off, and this continued until the proceſs can be conveniently carried no farther. The diſtilled acid muſt be rectified by a ſecond diſtillation in a retort or glaſs alembic; for although the head and receiver be of glaſs or ſtone ware, the acid will contract a metallic taint from the pewter worm.

The reſiduum of this proceſs is commonly thrown away as uſeleſs, although, if ſkilfully managed, it may be made to turn to good account, the ſtrongeſt acid ſtill remaining in it. Mixed with about three times its weight of fine dry ſand, and committed to diſtillation in a retort, with a well-regulated fire, it yields an exceedingly ſtrong empyreumatic acid. It is, nevertheleſs, without any rectification, better for ſome purpoſes, as being ſtronger, than the pure acid; particularly for making acetate of potaſs or ſoda: for then the empyreumatic oil is burnt out.

Diſtilled vinegar ſhould be colourleſs and tranſparent; have a pungent ſmell, and purely acid taſte, totally free from acrimony and empyreuma, and ſhould be entirely volatile. It ſhould not form a black precipitate on the addition of a ſolution of baryta, or of water ſaturated with ſulphuretted hydrogen; or change its colour when ſuper-ſaturated with ammonia. Theſe circumſtances ſhew, that it is adulterated with ſulphuric acid, or contains lead, copper, or tin.

Diſtilled acetous acid, in its effects on the animal economy, does not differ from vinegar, and as it is leſs pleaſant to the taſte, it is only uſed for pharmaceutical preparations.

Off. prep.—Acet. potaſſ. *Ed. Lond. Dub.* Aqua acet. ammon. *Ed. Lond. Dub.* Acet. plumbi, *Ed. Lond. Dub.* Aqua lith. acetat. *Lond. Dub.*

ACIDUM ACETOSUM FORTE. *Edin.*

Strong Acetous Acid.

Take of

Sulphate of iron dried, one pound;

Acetite of lead, ten ounces.

Having rubbed them together, put them into a retort, and diſtil in a ſand bath with a moderate heat, as long as any acid comes over.

ACIDUM ACETOSUM. *Lond.*

Acetous Acid.

Take of

Verdegris, in coarſe powder, two pounds,

Dry it perfectly by means of a water bath ſaturated with ſea-ſalt; then diſtil in a ſand bath, and rediſtil the liquor obtained.

Its ſpecific gravity is to that of diſtilled water as 1050 to 1000.

By theſe proceſſes, the acid we have before noticed under the title of acetic acid, is prepared. It is now generally believed to differ from diſtilled vinegar only in ſtrength, and in being perfectly free from all mucilaginous matter; therefore, according to the principles of nomenclature, which gives ſimple names to ſimple ſubſtances, the ſtrong acid ſhould be acetic acid, and our preſent acetous acid ſhould be weak or dilute acetic acid.

Many different proceſſes have been propoſed for preparing acetic acid, but they may be arranged in three claſſes. It may be prepared,

1. By decompoſing metalline acetates by heat,
2. ———————— acetates by ſulphuric acid.
3. ———————— acetates by ſulphates.

The proceſs of the London college is an example of the firſt kind. But the heat neceſſary is ſo great, that it decompoſes part of the acetic acid itſelf, and gives the product an empyreumatic and unpleaſant ſmell.

By the ſuperior affinity of ſulphuric acid, the acid may be eaſily expelled from every acetate, whether alkaline or metallic; but part of the ſulphuric acid ſeems to be deprived of its oxygen, and to be converted into ſulphurous acid, which renders the product impure.

The proceſſes of the laſt kind are preferable to the others in many reſpects. They are both more economical, and they furniſh a purer acid. Mr. Lowitz directs one part of carefully-dried acetate of ſoda to be triturated with three parts of ſuper-ſulphate of potaſs, and the diſtillation to be conducted in a glaſs retort with a gentle heat. The Berlin college mix together twelve ounces of ſulphate of potaſs with ſix of ſulphuric acid diluted with eighteen of water, and evaporate to dryneſs. With the ſuper-ſulphate of potaſs thus prepared they decompoſe nine ounces of acetate of ſoda dried with a gentle heat. The proceſs of the Edinburgh college alſo belongs to this claſs, and was firſt propoſed by C. Badollier, apothecary at Chartres.

Medical uſe.—It is almoſt ſolely uſed as an analeptic remedy in ſyncope, aſphyxia, hyſteric affections, and headachs. Applied to the ſkin, it acts as a ſtimulant and rubefacient, but it is moſt frequently ſnuffed up the noſtrils in the ſtate of vapour.

Off. prep.—Acidum acetoſum camph. *Ed.*

ACIDUM BENZOICUM. *Edin.*

Benzoic Acid.

Take any quantity of the balſam of the ſtyrax benzoin reduced to powder.

Put it into earthen veſſel, to which, after having covered it with a paper cone, apply a gentle heat that the acid may ſublime. If this be diſcoloured with oil, let it be purified by ſolution in warm water and cryſtallization.

SAL BENZOINI. *Dub.*

Salt of Benzoin.

Take of

Benzoin, in coarſe powder, one pound.

Place it in an earthen pot ſurrounded with ſand, and let the matter which ſublimes, ariſing with a gentle heat, be received in a conical paper capital.

It may be purified by ſolution in water, and cryſtallization.

SLORES BENZOES. *Lond.*

Flowers of Benzoin.

Take of

Benzoin, in powder, one pound.

Put it into an earthen pot placed in ſand; and, with a ſlow fire, ſublime the flowers into a paper cone fitted to the pot.

If the flowers be of a yellow colour, mix them with white clay, and ſublime them a ſecond time.

The diſtinguiſhing character of balſams is their containing benzoic acid. It may be ſeparated from the reſin, which is their other principal conſtituent, either by ſublimation, or by combining it with a ſalifiable baſe. The manner of effecting it in the firſt way, is that preſcribed by the pharmacopœias. But even with the greateſt care it is almoſt impoſſible to manage the heat ſo as not to decompoſe part of the reſin, and thus give riſe to the formation of an empyreumatic oil, which deſtroys the product. Nor can it be freed completely from the empyreumatic oil by the ſolution and cryſtallization preſcribed by the Edinburgh and Dublin colleges, and ſtill leſs by the ſecond ſublimation with clay, directed by that of London.

The other method of ſeparating benzoic acid from reſin, by combining it with a ſalifiable baſe, both gives a larger product, and of greater purity. It was firſt practiſed by Scheele, who employed lime-water; Göttling afterwards uſed carbonate of potaſs; and, laſtly, Gren uſed carbonate of ſoda, which has been adopted by the Berlin college.

Take of
  Benzoin, in powder, one pound;
  Carbonate of ſoda, four ounces;
  Water, four pounds.

Diſſolve the carbonate in the water, and digeſt the benzoin in the ſolution for twenty-four hours with a gentle heat; then boil it for a quarter of an hour, and filter the ſolution while hot. After it cools drop into it ſulphuric acid as long as any precipitate is produced. Separate the precipitate by filtration, and waſh it with cold water. The acid may be cryſtallized by boiling the precipitate gently in twenty-four times its weight of water, filtering it as hot and quickly as poſſible, and ſetting it aſide to cryſtallize. But as the cryſtallized acid, on account of its lightneſs and elaſticity, is not eaſily reduced to powder, for moſt purpoſes it will be more convenient to keep it in the ſtate of a precipitate.

It may alſo be extracted from ſtorax, and all the other balſams, particularly thoſe of Tolu or Peru; and from the urine of children, and of herbivorous animals.

The benzoic acid has an agreeable taſte, and a fragrant ſmell, eſpecially when heated. It is ſoluble in alcohol and in boiling water, but very ſparingly in cold water, although it may be ſuſpended in it, by means of ſugar, ſo as to form an elegant balſamic ſyrup.

Off. prep.—Tinct. opii camph. *Lond. Dub.* Tinct. opii ammon. *Ed.*

OLEUM SUCCINI ET ACIDUM SUCCINI. *Edin.*

Oil of Amber and Succinic Acid.

Take of
  Amber reduced to powder, and of pure ſand, equal parts.

Mix them, and put them into a glaſs retort, of which the mixture may fill one half: then adapt a large receiver, and diſtil in a ſand bath, with a fire gradually increaſed. At firſt, a watery liquor will come over, with ſome yellow oil; then a yellow oil, with an acid ſalt; and laſtly, a reddiſh and black-coloured oil.

Pour the liquor out of the receiver, and ſeparate the oil from the water. Preſs the ſalt collected from the neck of the retort and ſides of the receiver between folds of blotting paper, to free it from the oil adhering to it; then purify it by ſolution in warm water and cryſtallization.

SAL SUCCINI. *Dub.*
Salt of Amber.

Take of
Amber,
Pure ſand, each one pound.

Diſtil, with a heat gradually increaſed, an acid liquor, an oil, and a ſalt diſcoloured with oil. Let the ſalt be diſſolved in boiling water, and cryſtals formed by ſlow cooling.

SAL ET OLEUM SUCCINI. *Lond.*
Salt and Oil of Amber.

Take of
Amber, two pounds.

Diſtil in a ſand heat gradually augmented; an acid liquor, oil, and ſalt loaded with oil, will aſcend.

SAL SUCCINI PURIFICATUS. *Lond.*
Purified Salt of Amber.

Take of
Salt of amber, half a pound;
Diſtilled water, one pint.

Boil the ſalt in diſtilled water, and ſet aſide the ſolution to cryſtallize.

WE are not acquainted with any experiments which determine whether the ſuccinic acid exiſts as ſuch in the amber, or whether it be a product of the decompoſition of the amber by the action of heat, for in the proceſs employed for obtaining ſuccinic acid the amber is completely decompoſed.

The ſand is added by the Dublin college to prevent the amber from running together into maſſes, and impeding the diſtillation; but as it renders the reſiduum unfit for the uſe of the varniſher, it is not adviſable. According to Göttling, this diſtillation ſhould be performed in a tubulated iron or earthen-ware retort, expoſed to the immediate action of the fire; for he ſays, that, in a ſand bath we cannot regulate the heat ſufficiently, and that a glaſs retort is incapable of ſupporting the neceſſary temperature.

Beſides the ſuccinic acid collected from the neck of the retort, and ſides of the receiver, the oil waſhes down a portion of it into the receiver, and the watery liquor which comes over is ſaturated with it. But the whole of it may be obtained by agitating the oil with ſome boiling water, which will diſſolve the acid. This ſolution is then to be added to the acid liquor, and the acid they contain is eaſily obtained by evaporation and cryſtallization. The acid may afterwards be purified by ſolution in boiling water and cryſtallization, according to the directions of the colleges.

But even after repeated ſolutions and cryſtallizations, a portion of empyreumatic oil ſtill adheres to the acid, and renders it impure. Other methods of purifying it have been therefore attempted. Demachy ſaturated it with lime, ſeparated the lime by ſulphuric acid, and ſublimed the ſuccinic acid: Richter ſaturated ſuccinic acid with potaſs, decompoſed the ſalt formed with acetate of lead, and diſengaged the ſuccinic acid from the lead by mean of diluted ſulphuric acid: laſtly, Morveau aſſerts that he obtained it in a ſtate of perfect purity, by treating it with nitrous acid. It is often adulterated with muriate of ammonia, ſulphuric acid, ſulphate of potaſs, ſugar, &c. When pure it is entirely volatile, gives out no ammoniacal fumes when triturated with potaſs, is not precipitated by ſolutions of baryta, and is ſoluble in alcohol.

Succinic acid, although retained in our pharmacopœias, is never uſed in medicine.

AQUA AËRIS FIXI. *Dub.*
Water Impregnated with Fixed Air.

Take of

White marble in powder, three ounces;

Diluted ſulphuric acid, mixed with an equal quantity of water, a pound and a half.

Mix them gradually in a Nooth's apparatus, and let the air evolved paſs through ſix pounds of pure ſpring water, placed in the upper part of the apparatus; and let agitation be occaſionally employed until the water ſhall have acquired a ſub-acid taſte.

Carbonic acid may be ſeparated from carbonate of lime

a. By the action of heat alone.
b. By an acid having a ſuperior affinity for the lime.

In the former way the carbonic acid is perfectly pure, in the latter it carries over a little of the ſtronger acid, which gives a ſlight degree of pungency.

In this proceſs the carbonic acid is ſeparated from the carbonate of lime by the ſuperior affinity of ſulphuric acid. As it is diſengaged, it aſſumes a gaſeous form, and would be diſſipated in the atmoſphere, if it were not made to paſs through water, which, at a medium temperature, is capable of abſorbing about an equal bulk of this gas, and, by the aſſiſtance of preſſure, a much greater proportion.

Various contrivances have been made for this purpoſe. Of theſe the moſt eaſily managed, and moſt convenient for general uſe, is the apparatus of Nooth; and, for larger quantities, that of Woulfe, or ſome modification of it. By the proper application of preſſure, M. Paul of Geneva, now of London, is able to impregnate water with no leſs than ſix times its bulk of carbonic acid gas.

Med. uſe.—Water impregnated with carbonic acid, ſparkles in the glaſs, has a pleaſant acidulous taſte, and forms an excellent beverage. It diminiſhes thirſt, leſſens the morbid heat of the body, and acts as a powerful diuretic. It is alſo an excellent remedy in increaſed irritability of the ſtomach, as in advanced pregnancy; and it is one of the beſt anti-emetics which we poſſeſs.

CHAP. III.

ALKALIES.

AQUA POTASSÆ; vulgo, LIXIVIUM CAUSTICUM. *Edin.*
Water of Potaſs, commonly called *Cauſtic Ley.*

Take of
- Newly-prepared lime, eight ounces;
- Carbonate of potaſs, ſix ounces.

Put the lime into an iron or earthen veſſel, with twenty-eight ounces of warm water. After the ebullition is finiſhed, inſtantly add the ſalt; and having thoroughly mixed them, cover the veſſel till they cool. When the mixture has cooled, agitate it well, and pour it into a glaſs funnel, whoſe throat muſt be obſtructed with a piece of clean linen. Cover the upper orifice of the funnel, and inſert its tube into another glaſs veſſel, ſo that the water of potaſs may gradually drop through the rag into the lower veſſel. As ſoon as it ceaſes to drop, pour into the funnel ſome ounces of water; but cautiouſly, ſo that it may ſwim above the matter. The water of potaſs will again begin to drop, and the affuſion of water is to be repeated in the ſame manner, until three pounds have dropped, which will happen in the ſpace of two or three days; then mix the ſuperior and inferior parts of the liquor together by agitation, and keep it in a well-ſtopt phial.

AQUA KALI PURI. *Lond.*
Water of Pure Kali.

Take of
- Prepared kali, four pounds;
- Lime, ſix pounds;
- Diſtilled water, four gallons.

Put four pints of water to the lime, and let them ſtand together for an hour; after which, add the kali and the reſt of the water; then boil for a quarter of an hour; ſuffer the liquor to cool, and ſtrain it. A pint of this liquor ought to weigh ſixteen ounces.

If the liquor effervesce with any acid, add more lime, and boil the liquor and lime in a covered veſſel for five minutes. Laſtly, let it cool again, and ſtrain it.

LIXIVIUM CAUSTICUM. *Dub.*
Cauſtic Ley.

Take of
- Freſh burnt lime, eight ounces;
- Mild vegetable alkali, ſix ounces.

Put the lime into an earthen veſſel, and pour upon it thirty ounces of hot water. With the ſlaked lime immediately mix the ſalt, and cover the veſſel. Pour the mixture, as ſoon as it has cooled, into a glaſs funnel, whoſe throat is obſtructed with bits of ſtone covered with ſand. Having covered the funnel, let the ley drop into a veſſel placed to receive it; water being from time to time poured into the funnel, until three pounds have paſſed through. Let the liquor be agitated, and kept in a glaſs veſſel well cloſed.

If the ley be rightly prepared, it will have neither colour nor ſmell, and will not effervesce when mixed with acids.

The ſpecific gravity of this liquor is to that of diſtilled water as 1090 to 1000.

THESE proceſſes do not differ materially. They are founded upon the affinity of lime being ſtronger than that of potaſs for carbonic acid. Of courſe, when lime comes in contact with carbonate of potaſs, the carbonic acid quits the potaſs to unite with the lime, and the reſults of the mixture are potaſs and carbonate of lime. Now, as the carbonate of lime is inſoluble in water, and the potaſs is very ſoluble, they may be ſeparated by filtration. In doing this, however, we muſt take care to employ inſtruments on which the ſolution of potaſs does not act, and to prevent the free acceſs of air, from which it would attract carbonic acid, and thus fruſtrate the whole operation. The latter object is attained by covering the upper or broad end of the funnel with a plate of glaſs, and inſerting the lower end in the neck of a phial, which it fits pretty cloſely. The former object is attended with greater difficulties, and indeed ſcarcely to be effected, ſo powerful and general is the agency of potaſs. All animal ſubſtances are immediately attacked and deſtroyed by it; therefore, our filters cannot be made of ſilk, woollen, or paper which contains glue; and although neither vegetable matters nor ſilica entirely eſcape its action, linen and ſand are, on the whole, the leaſt objectionable. A filter of ſand was uſed by Dr. Black. He firſt dropt a rugged pebble into the tube of the funnel, in ſome part of which it formed itſelf a firm bed, while the inequalities on its ſurface afforded interſtices of ſufficient ſize for the paſſage of the filtering liquor. On the upper ſurface of this ſtone he put a thin layer of lint or clean tow; immediately above this, but not in contact with it, he dropped a ſtone ſimilar to the former, and of a ſize proportioned to the ſwell in the upper part of the tube of the funnel. The interſtices between this ſecond ſtone and the funnel were filled up with ſtones of a leſs dimenſion, and the gradation uniformly continued till pretty ſmall ſand was employed. Finally, this was covered with a layer of coarſer ſand, and ſmall ſtones, to ſuſtain the weight of the matter. A filter of ſand being thus conſtructed in the funnel, it was waſhed perfectly clean by making clean water paſs through it, till it dropt from the lower extremity of the funnel perfectly clear and tranſparent; and before uſing it, it ſhould be allowed to ſtand for ſome days, that no water may remain among the interſtices of the ſand.

From the ſpongy nature of the reſiduum which remains upon the filter, and eſpecially if we uſe that of ſand, a conſiderable quantity of the ſolution of potaſs will be retained. It is, however, eaſily obtained, by pouring gently over it, ſo as to diſturb it as little as poſſible, a quantity of water; the ley immediately begins again to drop from the funnel, and as, from the difference of their ſpecific gravity, the water does not mix with it, but ſwims above it, the whole ley paſſes through before any of the water. By means of the taſte, we eaſily learn when the whole ley has paſſed.

As it is natural to ſuppoſe that the ſtrongeſt ſolution will paſs firſt, and the weakeſt laſt, we are directed to agitate the whole together, to render their ſtrength uniform.

If the ſolution of potaſs be pure, it will be colourleſs, and it will neither effervesce with acids, nor form a precipitate with carbonate of potaſs. If it effervesces, carbonic acid is preſent, and muſt be ſeparated by again boiling the ſolution with a little lime, or by dropping into it lime-water, as long as it produces any precipitate. If, on the contrary, it contain lime, from too much of it having been employed in the preparation, it may be ſeparated by dropping into the ley a ſolution of the carbonate of potaſs. When we have thus purified our ſolution of potaſs, it muſt be again filtered.

Med. uſe.—The ſolution of cauſtic potaſs, under various names, has at different times been celebrated as a lithontriptic, and as often fallen again into diſuſe. The very contradictory accounts of its effects as a ſolvent are now in ſome degree explicable, ſince it has been diſcovered that urinary calculi are very different in their natures, ſo that ſome of them are only ſoluble in acids, and others only in alkalies. Of the laſt deſcription are the calculi of uric acid, which are very frequent, and thoſe of urate of ammonia. On theſe, therefore, alkalies may be ſuppoſed to make ſome impreſſion; and that alkalies, or alkaline carbonates, taken by the mouth, have occaſionally relieved calculous complaints, is certain. It is, however, ſaid that their continued uſe debilitates the ſtomach; and M. Fourcroy has propoſed applying the remedy immediately to the diſeaſe, by injecting into the bladder a tepid ſolution of potaſs or ſoda, ſo dilute that it can be held in the mouth. Before the alkaline ſolution be injected, the bladder is to be completely evacuated of urine, and waſhed out with an injection of tepid water. After the alkaline injection has remained in the bladder half an hour or more, it is to be evacuated, and allowed to ſettle. If, on the addition of a little muriatic acid, a precipitate be formed, we ſhall have reaſon to conclude that the calculus contains uric acid, and that the alkali has acted on it.

Very dilute alkaline ſolutions may alſo be taken into the ſtomach as antacids, but we poſſeſs others which are preferable.

Externally, alkaline ſolutions have been more frequently uſed, either very dilute, ſimply as a ſtimulus, in rickets, gouty ſwellings, gonorrhœa, and ſpaſmodic diſeaſes, or concentrated as a cauſtic to deſtroy the poiſon of the viper, and of rabid animals.

Off. prep.—Sulphuret ant. præcip. *Ed. Lond. Dub.*

POTASSA; olim, CAUSTICUM COMMUNE ACCERRIMUM. *Ed.*
Potaſs; formerly, *Strongeſt common Cauſtic.*

Take of

The ſolution of potaſs, any quantity.

Evaporate it in a covered very clean iron veſſel, till, on the ebullition ceaſing, the ſaline matter flows gently like oil, which happens before the veſſel becomes red. Then pour it out on a ſmooth iron plate; let it be divided into ſmall pieces before it hardens, and immediately placed in a well-ſtopt phial.

KALI PURUM. *Lond.*
Pure Kali.

Take of

Water of pure kali, one gallon.

Evaporate it to dryneſs; after which let the ſalt melt on the fire, and pour it out.

ALKALI VEGETABILE CAUSTICUM. *Dub.*
Cauſtic Vegetable Alkali.

Take of

Cauſtic ley, any quantity.

Evaporate it over the fire in a very clean iron veſſel, until the ebullition having ceaſed, the ſaline matters, on increaſing the heat, remain almoſt at reſt. Let the liquefied ſalt be poured out upon an iron plate, and while it is congealing, be cut into proper pieces, which are immediately to be ſhut up in very cloſe veſſels.

The principal thing to be attended to in this operation, is to conduct the evaporation ſo rapidly that the ley ſhall not abſorb any carbonic acid from the atmoſphere. As long as any water of ſolution remains, the ebullition is evident, and the evaporation is to be continued until it ceaſe. The heat is then to be increaſed a little, which renders the potaſs perfectly fluid, and gives it the appearance of an oil, when it is ready to be poured out, either on a flab, as directed by the colleges, or into iron moulds, ſuch as are uſed for the melted nitrate of ſilver.

The potaſs prepared according to theſe directions is ſufficiently pure for medical uſe, but is not fit for chemical experiments. We can however obtain it perfectly white and cryſtallized, according to Berthollet, by adding to the ley, when evaporated ſo far that it would aſſume the conſiſtence of honey if permitted to cool, a quantity of alcohol equal to one third of the carbonate of potaſs operated on, mixing them together, and letting them boil a minute or two. The mixture is then to be poured into a glaſs veſſel, and corked up, when the impurities will gradually ſubſide, partly in a ſolid form, and partly diſſolved in water. The ſuper-natant alcoholic ſolution is then to be evaporated rapidly, till its ſurface become covered with a black cruſt, which is to be removed, and the liquid below is to be poured into a porcelain veſſel, when it will concrete into a white ſubſtance, which is to be broken in pieces, and immediately excluded from the action of the air.

A leſs expenſive way of obtaining potaſs perfectly pure is that of Lowitz. Evaporate a ſolution of potaſs till a thick pellicle form on its ſurface; allow it to cool; ſeparate all the cryſtals formed, as they conſiſt of foreign ſalts: renew the evaporation in an iron or ſilver baſon; and remove the pellicles which form on the ſurface with an iron ſkimmer, as long as any appear. When the ebullition ceaſes, remove the veſſel from the fire, and agitate the fuſed ſalt with an iron ſpatula while it cools. Diſſolve the ſaline maſs in twice its weight of water, and evaporate in a ſilver baſon till it begins to cryſtallize. The cryſtals are pure potaſs. The fluid which ſwims over them has a dark-brown colour, and muſt be poured off; but if kept in a cloſe-ſtopt phial, it will depoſit its colouring matter, and by evaporation will furniſh more cryſtals of potaſs.

Med. uſe.—Potaſs is only uſed as a cauſtic, or to form ſolutions of a known ſtrength; and even its uſe as a cauſtic is inconvenient, from its being ſo quickly affected by the air, and from its rapid deliqueſcence, which renders it apt to ſpread.

Off. prep.—Alk. veget. ſulph. *Dub.* Alcohol, *Lond. Dub.* Æth. ſulph. *Ed. Lond. Dub.*

POTASSA CUM CALCE; olim, CAUSTICUM COMMUNE MITIUS. *Edin.*

Potaſs with Lime, formerly *Milder common Cauſtic.*

Take of

Solution of potaſs, any quantity.

Evaporate in a covered iron veſſel till one third remains; then mix with it as much new-ſlaked lime as will bring it to the conſiſtence of pretty ſolid pap, which is to be kept in a veſſel cloſely ſtopt.

CALX CUM KALI PURO. *Lond.*

Lime with Pure Kali.

Take of

Quicklime, five pounds and four ounces;
Water of pure kali, ſixteen pounds.

Boil away the water of pure kali to a fourth part; then ſprinkle in the lime, reduced to powder by the affuſion of water. Keep it in a veſſel cloſely ſtopped.

CAUSTICUM MITIUS. *Dub.*

Milder Cauſtic.

Evaporate cauſtic ley to one third, then add powdered lime till it become thick, and form it into proper maſſes.

THE addition of the lime in theſe preparations renders them leſs apt to deliqueſce, more eaſily managed, and milder in their operation.

CARBONAS POTASSÆ. *Edin.*

Carbonate of Potaſs.

Let impure carbonate of potaſs, called in Engliſh *pearl aſhes*, be put into a crucible, and brought to a low red heat, that the oily impurities, if there be any, may be burnt out: then triturate it with an equal weight of water, and mix them thoroughly by agitation. After the feces have ſubſided, pour the liquor into a very clean iron pot, and boil to dryneſs, ſtirring the ſalt towards the end of the proceſs, to prevent its ſticking to the veſſel.

KALI PRÆPARATUM. *Lond.*

Prepared Kali.

Take of

Potaſhes, two pounds.
Boiling diſtilled water, three pints.

Diſſolve and filter through paper; evaporate the liquor till a pellicle appears on the ſurface; then ſet it aſide for twelve hours, that the neutral ſalts may cryſtallize: after which, pour out the liquor, and boil away, with a ſlow fire, the whole of the water, conſtantly ſtirring, leſt the ſalt ſhould adhere to the pot.

In like manner is purified impure kali from the aſhes of any kind of vegetable.

The ſame ſalt may be prepared from tartar, which ſhould be burnt till it becomes of an aſh colour.

ALKALI VEGETABILE MITE. *Dub.*
Mild Vegetable Alkali.

Take of

Potaſhes,
Boiling water, each ſix pounds.

Mix them by agitation in a glaſs veſſel, and digeſt them for three days. Then pour off the pure liquor, and evaporate it to dryneſs in a very clean iron veſſel. Towards the end of the operation, ſtir the ſaline maſs conſtantly with an iron ſpatula. Then ſeparate, by means of a ſieve, the finer particles, which are to be kept in a glaſs veſſel well ſtopped.

CARBONAS POTASSÆ PURISSIMUS; olim, SAL TARTARI. *Edin.*
Pure Carbonate of Potaſs; formerly *Salt of Tartar.*

Take of

Impure ſuper-tartrate of potaſs, any quantity.

Wrap it up in moiſt bibulous paper, or put into a crucible, and burn it to a black maſs, by placing it among live coals. Having reduced this maſs to powder, expoſe it in an open crucible to the action of a moderate fire, till it become white, or at leaſt of an aſh-grey colour, taking care that it do not melt. Then diſſolve it in warm water; ſtrain the liquor through a linen cloth, and evaporate it in a clean iron veſſel, diligently ſtirring it towards the end of the proceſs with an iron ſpatula, to prevent it from ſticking to the bottom of the veſſel. A very white ſalt will remain, which is to be left a little longer on the fire, till the bottom of the veſſel becomes almoſt red. Laſtly, when the ſalt is grown cold, keep it in glaſs veſſels well ſtopt.

THE potaſh of commerce we have already ſhewn to contain a conſiderable proportion of foreign ſalts. By the proceſs directed by the colleges, it is purified from thoſe which are cryſtallizable; and although it ſtill contains muriate of potaſs and ſilica, it is ſufficiently pure for the purpoſes of medicine.

The pureſt carbonate of potaſs in common uſe is that obtained by incinerating the impure ſuper-tartrate of potaſs, as all the ſubſtances it contains, except the potaſs, are decompoſed by the heat. The tartaric acid and colouring matter are deſtroyed, and part of the carbonic acid, which is formed, unites with the potaſs.

But this ſalt, in whatever way obtained, is not ſtrictly intitled to the appellation of carbonate; for it is not ſaturated with the acid, or rather it is a mixture of carbonate of potaſs and potaſs, in variable proportions. It is owing to the uncombined potaſs that it is ſtill deliqueſcent, and in ſome degree cauſtic. It may be eaſily ſaturated, however, with carbonic acid, by expoſing it in ſolution to the contact of the air for a conſiderable time, or by making a ſtream of carbonic acid gas paſs through a ſolution of it, or by diſtilling it with carbonate of ammonia. M. Curadau has propoſed a cheaper mode of ſaturating potaſs with carbonic acid. He diſſolves the potaſs in a ſufficient quantity of boiling water, mixes it with as much dried tanner's bark as to make it pretty dry, and then expoſes the mixture in a covered crucible to the heat of a reverberatory furnace for half an hour. By lixiviation and cryſtallization, the mixture affords beautiful cryſtals of carbonate of potaſs. In this ſtate it is cryſtallizable, and its cryſtals are permanent. It conſiſts of about 43 acid, 40 potaſs, and 17 water. The ſaturation with carbonic acid is one of the beſt means of purifying it; for it always ſeparates ſilica from the uncombined alkali.

Med. uſe.—Carbonate of potaſs is frequently employed in medicine, in conjunction with other articles, particularly for the formation of ſaline neutral draughts and mixtures: but it is uſed alſo by itſelf in doſes from three or four grains to fifteen or twenty; and it frequently operates as a powerful diuretic, particularly when aided by proper dilution.

Off. prep.—Aqua potaſſæ, *Lond. Ed. Dub.* Aqua ſuper-carbonatis potaſſæ, *Ed. Dub.* Acetis potaſſ. *Ed. Lond. Dub.* Sulphas potaſſæ, *Ed.* Sulphur. pot. *Ed. Lond.* Tartris pot. *Ed. Lond. Dub.* Sulph. ſtib. fuſcum, *Dub.* Calx ſtibii præcip. *Dub.* Alcohol, *Lond. Dub.*

AQUA KALI PRÆPARATI. *Lond.*
Water of Prepared Kali.

Take of

Prepared kali, one ponnd.

Set it in a moiſt place till it deliqueſce, and then ſtrain it.

LIXIVIUM MITE. *Dub.*
Mild Ley.

Take of

Mild vegetable alkali, one pound.

Diſſolve it in one pound of water.

The laſt of theſe preparations is a ſolution of the mixed or ſub-carbonate of potaſs, in a fixed proportion of water; and the former is a ſolution of carbonate of potaſs, in a variable quantity of water. The Dublin ſolution contains the ſilica, and all the other impurities of the carbonate employed, while, according to the London proceſs, the uncombined portion of the potaſs, at the ſame time that it deliqueſces, becomes ſaturated with carbonic acid, and depoſites the ſilica. It would, therefore, be a very conſiderable improvement of this preparation, to diſſolve cryſtallized carbonate of potaſs in a determinate proportion of water.

Off. prep.—Calx hdrarg. alb. *Lond.*

AQUA SUPER-CARBONATIS POTASSÆ. *Ed.*
Solution of Super-carbonate of Potaſs.

Take of
  Water, ten pounds;
  Pure carbonate of potaſs, one ounce.
Diſſolve and expoſe the ſolution to a ſtream of carbonic acid, ariſing from
    Carbonate of lime in powder,
    Sulphuric acid, each three ounces;
    Water, three pounds, gradually and cautiouſly mixed.

The chemical apparatus invented by Dr. Nooth is well adapted for this preparation. But if a larger quantity of the liquor be required, the apparatus of Dr. Woulfe is preferable.

Liquor Alkali Vegetabilis Mitissimi. *Dub.*
Solution of Mildeſt Vegetable Alkali.

Take of
  Mild vegetable alkali, an ounce and a half;
  Water, ſix pounds.
Mix them, and tranſmit fixed air through the liquor, according to the formula for preparing fixed air (p. 402.), except that a double quantity of marble and acid muſt be employed to ſaturate the ſolution.
The colder the air is, and the greater the preſſure, the better is the liquor, which ſhould be kept in well-cloſed veſſels.

As ſoon as the preparation is finiſhed, the liquor ſhould be drawn off into pint bottles, which are to be well corked, and kept in a cool ſituation, with the head down, or laid on one ſide. It ſhould be perfectly tranſparent, and have an acidulous, not at all alkaline taſte; and when poured out of the bottles, it ſhould have a ſparkling appearance.

Medical uſe.—In this ſolution, carbonate of potaſs is combined with exceſs of carbonic acid, by which means it is better adapted for internal uſe, as it is rendered not only more pleaſant to the taſte, but is leſs apt to offend the ſtomach. Indeed, it is the only form in which we can exhibit potaſs in ſufficient doſes, and for a ſufficient length of time, to derive much benefit from its uſe in calculous complaints. It has certainly been frequently of advantage in theſe affections, but probably only in thoſe inſtances in which the ſtone conſiſts of uric acid, or urate of ammonia: for although ſuperſaturated with carbonic acid, yet the affinity of that acid for potaſs is ſo weak, that it really operares as an alkali.

Six or eight ounces may be taken two or three times a-day. It in general proves powerfully diuretic, and ſometimes produces inebriation. This laſt effect is aſcribed to the carbonic acid.

ACETIS POTASSÆ. *Ed.*

Acetite of Potaſs.

Take of

Pure carbonate of potaſs, one pound.

Boil it with a very gentle heat, in four or five times its weight of diſtilled acetous acid, and add more acid at different times, till, on the watery part of the preceeding quantity being nearly diſſipated by evaporation, the new addition of acid ceaſes to raiſe any effervеſcence, which will happen, when about twenty pounds of acid have been conſumed. It is then to be ſlowly dried. The impure ſalt remaining, is to be melted with a gentle heat, for a ſhort time; and afterwards diſſolved in water, and filtered through paper. If the liquefaction has been properly performed, the filtered liquor will be limpid; but if otherwiſe, of a brown colour. Afterwards evaporate this liquor with a very gentle heat in a very ſhallow glaſs-veſſel, occaſionally ſtirring the ſalt as it becomes dry, that its moiſture may be ſooner diſſipated. Laſtly, the acetite of potaſs ought to be kept in a veſſel very cloſely ſtopt, to prevent it from deliqueſcing.

KALI ACETATUM. *Lond.*

Acetated Kali.

Take of

Prepared kali, one pound.

Boil it, with a ſlow fire, in four or five times its quantity of diſtilled vinegar; and when the effervеſcence ceaſes, add at different times, more diſtilled vinegar, until one portion of vinegar being nearly evaporated, the addition of another will excite no effervеſcence, which will happen when about twenty pounds of diſtilled vinegar are conſumed; afterwards let it be dried ſlowly. An impure ſalt will be left, which is to be melted for a little while with a ſlow fire; then diſſolved in water, and filtered through paper.

If the fuſion has been rightly performed, the ſtrained liquor will be colourleſs; if otherwiſe, of a brown colour.

Laſtly, evaporate this liquor with a ſlow fire, in a very ſhallow glaſs-veſſel; frequently ſtirring the maſs, that the ſalt may be more completely dried, which ſhould be kept in a veſſel cloſely ſtopt.

The ſalt ought to be very white, and diſſolve wholly, both in water and ſpirit of wine, without leaving any feces. If the ſalt, although white, ſhould depoſite any feces in ſpirit of wine, the ſolution ſhould be filtered through paper, and the ſalt again dried.

ALKALI VEGETABILI ACETATUM; olim, SAL DIURETICUS.
Dub.
Acetated Vegetable Alkali, formerly *Diuretic Salt.*

Take of
Mild vegetable alkali, any quantity.

Add to it at different times, about five times its weight of diſtilled vinegar, at a moderate temperature. When the evaporation ceaſes, and the liquor is ſomewhat evaporated, add, at intervals, diſtilled vinegar, until the mixture ſhall entirely ceaſe to effervesce. Then evaporate to dryneſs; and having increaſed the fire a little, bring the ſaline maſs into a ſtate of fuſion. Diſſolve the ſalt, after it has cooled, in water: filter the ſolution, and evaporate, until, on cooling, it ſhall concrete into a cryſtalline maſs, which ſhould be very white. Put this, while ſtill warm, into veſſels accurately cloſed.

THIS is both a troubleſome and expenſive preparation, for when attempted to be made by ſimply evaporating to dryneſs, the ſalt has always a dark, unpleaſant colour, which can neither be removed by repeated ſolution and cryſtallization, nor even by ſolution in alcohol. It is doubtful to what the colour is owing. It has been aſcribed by ſome to part of the acetic acid being decompoſed by heat during the exſiccation of the ſalt: they accordingly recommend the evaporation to be conducted very gently, and the pellicles to be ſkimmed from the ſurface of the liquor as faſt as they are formed; and in this way, they ſay, they have procured at once a very white ſalt. Others aſcribe it to ſome foreign matter which riſes in diſtillation with the laſt portions of the acetous acid, and therefore direct, that only the firſt portions which come over ſhould be uſed, or that the acetous acid ſhould be diſtilled with charcoal: while others again aſcribe it to accidental impurities contracted during the operation, and recommend the utmoſt attention to cleanlineſs, and the uſe of earthen veſſels. To whatever cauſe it may be owing, and the ſecond appears to us the moſt probable, the colour is moſt effectually deſtroyed by fuſing the ſalt. The heat neceſſary to do this, decompoſes the colouring matter; and on diſſolving the fuſed maſs in water, and filtering the ſolution, we find a fine light charcoal on the filter. But this fuſion is attended with conſiderable loſs, for part of the acetic acid itſelf is decompoſed.

The operator muſt be particularly careful, in melting it, not to uſe a greater heat, nor to keep it longer liquified, than what is abſolutely neceſſary: a little ſhould be occaſionally taken out, and put into water; and as ſoon as it begins to part freely with its black colour, the whole is to be removed from the fire.

The exſiccation of the ſolution of the ſalt, after it has been fuſed, muſt be conducted very carefully, as it is exceedingly apt to be decompoſed, which would render a new ſolution and exſiccation neceſſary. The teſt of its purity, by diſſolving it in alcohol, as directed by the London college, is to diſcover if any of the acetous acid itſelf has been decompoſed in the operation; for the carbonate of potaſs, which is in that caſe formed, is inſoluble in alcohol.

To ſpare trouble and expence, attempts have been made to prepare acetate of potaſs with undiſtilled vinegar, and even with the reſiduum of the diſtillation of acetic acid: and they have been to a certain degree ſucceſsful: but as repeated fuſion and cryſtallization are neceſſary to bring the ſalt to a ſufficient degree of purity, it does not appear that they were more economical. But if to acetate of potaſs prepared with impure vinegar, we add a ſufficient quantity of ſulphuric acid, by diſtillation we obtain an acetic acid of great ſtrength, which forms a beautiful acetate of potaſs without fuſion. Laſtly, this ſalt may be prepared by the decompoſition of acetates; for example, of the acetate of lime by tartrate of potaſs.

Acetate of potaſs has a ſharp, ſomewhat pungent taſte. It is ſoluble at 60°, in about its own weight of water. It is alſo ſoluble in alcohol. It is deliqueſcent. It is decompoſed by the ſtronger acids; by a decoction of tamarinds; by the ſulphate of ſoda and magneſia; by muriate of ammonia; by the tartrate of ſoda and potaſs; and by ſome metalline ſalts. Its acid is deſtroyed by a high temperature.

Medical uſe.—Acetate of potaſs, which way ſoever prepared, provided it be properly made, is a medicine of great efficacy, and may be ſo doſed and managed as to prove either mildly cathartic, or powerfully diuretic; few of the ſaline deobſtruents equal it in virtue. The doſe is from half a ſcruple to a drachm or two. A ſimple ſolution, however, of alkaline ſalt in vinegar, without exſiccation, is perhaps not inferior as a medicine to the more expenſive ſalt. Two drachms of the alkali, ſaturated with vinegar, have been known to occaſion, in hydropic caſes, ten or twelve ſtools, and a plentiful diſcharge of urine, without any inconvenience.

Off. prep.—Tinctura ferri acetati. *Dub.* Acetis hydrarg. *Ed. Lond. Dub.*

NITRUM PURIFICATUM. *Lond.*

Purified Nitre.

Take of
Nitre, two pounds;
Diſtilled water, four pints.

Boil the nitre in the water, till it be diſſolved; ſtrain the ſolution, and ſet it aſide to cryſtallize.

Common nitre contains uſually a conſiderable portion of muriate of ſoda, which in this proceſs is ſeparated, for it remains diſſolved after the greateſt part of the nitrate of potaſs has cryſtallized. The cryſtals which ſhoot after the firſt evaporation, are large, regular, and pure: but when the remaining liquor is further evaporated, and this repeated a ſecond or third time, the cryſtals prove at length ſmall, imperfect, and tipt with little cubical cryſtals of muriate of ſoda. When pure, their ſolution is not affected by nitrate of ſilver, or nitrate of baryta.

SULPHAS POTASSÆ; olim, TARTARUM VITRIOLATUM. *Edin.*

Sulphate of Potaſs, formerly *Vitriolated Tartar.*

Take of
Sulphuric acid, diluted with ſix times its weight of water, any quantity.

Put it into a capacious glaſs veſſel, and gradually drop into it, of pure carbonate of potaſs, diſſolved in ſix times its weight of water, as much as is ſufficient thoroughly to neutralize the acid. The effervеſcence being finiſhed, ſtrain the liquor through paper; and after evaporation, ſet it aſide to cryſtallize.

Sulphate of potaſs may be alſo conveniently prepared from the reſiduum of the diſtillation of nitrous acid, by diſſolving it in warm water, and ſaturating it with carbonate of potaſs.

KALI VITRIOLATUM. *Lond.*
Vitriolated Kali.

Take of

The ſalt which remains after the diſtillation of the nitrous acid, two pounds;

Diſtilled water, two gallons.

Burn out the ſuperfluous acid with a ſtrong fire, in an open veſſel: then boil it a little while in the water; ſtrain, and ſet the liquor aſide to cryſtallize.

ALKALI VEGETABILE VITRIOLATUM. *Dub.*
Vitriolated Vegetable Alkali.

Let the ſalt which remains after the diſtillation of nitrous acid reduced to powder, be diſſolved in a ſufficient quantity of boiling water. Let the filtered liquor be evaporated with a very gentle heat, that it may cryſtallize.

THIS ſalt is very ſeldom prepared on purpoſe, as it may be obtained from the reſiduum of many other preparations, by ſimple ſolution and cryſtallization. For ſo ſtrong is the affinity between ſulphuric acid and potaſs, that they ſcarcely ever meet without combining to form this ſalt. All the ſulphates, except that of baryta are decompoſed by potaſs and moſt of its combinations; and reciprocally, all the compounds of potaſs are decompoſed by ſulphuric acid and moſt of its combinations; and in all theſe decompoſitions, ſulphate of potaſs is one of the products.

The greateſt part of the ſulphate of potaſs of commerce is obtained from the reſiduum of the diſtillation of ſulphate of iron with nitrate of potaſs, by lixiviating it, ſuperſaturating the ſolution with carbonate of potaſs, filtering it boiling hot, and allowing it to cryſtallize. The liquor remaining after the precipitation of magneſia, is alſo a ſolution of ſulphate of potaſs. It is alſo got in conſiderable quantities from the reſiduum remaining in the retort, after the diſtillation of nitrous acid; and all the colleges have given directions for obtaining it in this way. This reſiduum generally contains an exceſs of acid, which converts part of the ſulphate into ſuper-ſulphate of potaſs. The Dublin college allow this part to be loſt. The London drive off the exceſs of acid by intenſe heat, and thus get the whole of the ſulphate; but at the ſame time convert it into a very difficultly ſoluble maſs. While the Edinburgh college, more ſcientifically economical than either, derive advantage from the exceſs of acid, by ſimply ſaturating it with carbonate of potaſs.

As the reſiduum of the diſtillation of nitrous acid may not always be at hand, the Edinburgh college alſo give a receipt for making this ſalt, by directly combining its conſtituents. It would have been more economical to have uſed a ſolution of ſulphate of iron, in place of ſulphuric acid, by which means not only an equally pure ſulphate of potaſs would have been procured at leſs expence, but alſo a very pure carbonate of iron.

Sulphate of potaſs forms ſmall tranſparent very hard cryſtals, generally aggregated in cruſts and permanent in the air. It has a bitter taſte, is ſlowly ſoluble in water, requiring 16 parts at 60°, and 4 at 212°. It is not ſoluble in alcohol. It decrepitates when thrown on live coals, and melts in a red heat. It conſiſts of 45.2 acid, and 54.8 potaſs. It is decompoſed by the barytic ſalts; by the nitrates and muriates of lime and of ſtrontia; by the tartrites partially; and by the ſalts of mercury, ſilver and lead.

Medical uſe.—Sulphate of potaſs, in ſmall doſes, as a ſcruple or half a drachm, is an uſeful aperient; in larger ones, as four or five drachms, a mild cathartic, which does not paſs off ſo haſtily as the ſulphate of ſoda, and ſeems to extend its action further.

Off. prep.—Pulv. ipec. et opii, *Ed. Lond. Dub.* Pulv. ſcam. comp. *Lond.*

SULPHAS POTASSÆ CUM SULPHURE; olim, SAL POLYCHRESTUS. *Edin.*

Sulphate of Potaſs with Sulphur, formerly *Sal Polychreſt.*

Take
Nitrate of potaſs in powder,
Sublimed ſulphur, of each equal parts.

Mingle them well together, and inject the mixture, by little and little at a time, into a red-hot crucible: the deflagration being over, let the ſalt cool, after which it is to be put up in a glaſs veſſel well ſtopped.

In this proceſs the nitric acid of the nitrate of potaſs is decompoſed by the ſulphur, which is in part acidified. But the quantity of oxygen contained in the nitric acid, is not always ſufficient to acidify the whole ſulphur employed; therefore part of it remains in the ſtate of ſulphureous acid, which is probably chemically combined with part of the potaſs in the ſtate of ſulphite, for the whole ſaline maſs formed, is more ſoluble in water than ſulphate of potaſs. It is cryſtallizable, and by expoſure to the air, gradually attracts oxygen, and is converted into ſulphate of potaſs. In ſome experiments which I made to determine the ſtate in which the ſulphur exiſted in this ſalt carefully prepared, it ſeemed to be ſulphuric acid; for it neither gave out a ſulphureous ſmell on the addition of ſulphuric acid, nor was a ſolution of it precipitated by acids. In its medical effects and exhibition, it agrees with ſulphate of potaſs.

Off. prep.—Pil aloes cum colocynth.

SULPHURETUM POTASSÆ; olim, HEPAR SULPHURIS. *Edin.*

Sulphuret of Potaſs, formerly *Liver of Sulphur.*

Take of
Carbonate of potaſs,
Sublimed ſulphur, each eight ounces.

Grind them well together, put them into a large coated crucible; fit a cover to it, and having applied live coals cautiouſly around it, bring them at length to a ſtate of fuſion.

Break the crucible as ſoon as it has grown cold, take out the ſulphuret, and keep it in a well-cloſed phial.

KALI SULPHURATUM. *Lond.*

Sulphuretted Kali.

Take of
Flowers of ſulphur, one ounce;
Prepared kali, five ounces.

With the ſulphur melted with a gentle fire, mix the ſalt by conſtant agitation until they unite.

ALKALI VEGETABILE SULPHURATUM. *Dub.*

Sulphuretted Vegetable Alkali.

Take of
Cauſtic vegetable alkali in powder.
Sublimed ſulphur, each two ounces.

To the ſulphur, melted by a gentle heat, add the alkali; covering the veſſel, if the mixture ſhall take fire.

THERE exiſts a very ſtrong affinity between ſulphur and potaſs, but they muſt be united in a ſtate of perfect dryneſs; becauſe, if any moiſture be preſent, it is decompoſed, and alters the nature of the product. If potaſs be employed as directed by the Dublin college, it will unite with the ſulphur by ſimple trituration, and will render one third of its weight of ſulphur ſoluble in water. If carbonate of potaſs be uſed as directed by the other colleges, it is neceſſary to bring the ſulphur into a ſtate of fuſion; it then acts upon the carbonate, and expels the carbonic acid. It is evident, that to combine with the ſame quantity of ſulphur, a larger proportion of carbonate of potaſs than of potaſs is neceſſary; but the quantity ordered by the London college is certainly much too large. Göttling directs only one part of carbonate of potaſs to two of ſulphur; and to ſave the crucible, he directs the mixture, as ſoon as it melts, to be poured into a heated mould, anointed with oil. The colleges alſo differ in the mode of conducting the proceſs. The London and Dublin colleges direct the alkaline ſalt to be projected upon the melted ſulphur. The fault of this proceſs is, that there is a conſiderable loſs of ſulphur by ſublimation, which is avoided, if the ſubſtances be previouſly intimately mixed, and brought into fuſion by a very gradual and cautious application of heat, according to the proceſs of the Edinburgh college; but, if the fuſion be not very cautiouſly performed, the ſudden extrication of ſo large a quantity of carbonic acid gas, is apt to throw the melted matter out of the crucible, and may be attended with unpleaſant conſequences. La Grange projects one part of ſulphur, or one and a half of potaſs in fuſion, and keeps the compound melted half an hour before he pours it out. If the heat be too great, and the crucible uncovered, the ſulphureous vapour is apt to inflame, but it is eaſily extinguiſhed by covering it up. For the preparation of precipitated ſulphur, Hermbſtaedt propoſes to obtain the ſulphuret of potaſs, by heating together in a crucible four parts of ſulphate of potaſs with one of charcoal powder. The charcoal is converted into carbonic acid gas, and the ſulphate into ſulphuret.

Sulphuret of potaſs, properly prepared, is of a liver-brown colour, hard, brittle, and has a vitreous fracture. It has an acrid bitter taſte, and the ſmell of ſulphur. It is exceedingly prone to decompoſition. It is deliqueſcent in the air, and is decompoſed. It is very fuſible, but a ſtrong heat ſeparates the ſulphur by ſublimation. The moment it comes in contact with water, there is a mutual decompoſition. Part of the ſulphur becomes acidified, deriving oxygen from the water, and forms ſulphate of potaſs. Part of the hydrogen of the water decompoſed, combines with another portion of the ſulphur, and eſcapes in the form of ſulphuretted hydrogen gas; another portion of the hydrogen combines with a third portion of the ſulphur, and remains in ſolution, united with the alkali, in the ſtate of hydroguretted ſulphuret of potaſs. By acids, ſulphuret of potaſs is immediately decompoſed; the acid forms a neutral ſalt with the potaſs, and the ſulphur is ſeparated.

Off. prep.—Sulph. præc. *Lond. Dub.*

TARTRIS POTASSÆ; olim, TARTARUM SOLUBILE. *Ed.*
Tartrite of Potaſs, formerly *Soluble Tartar.*

Take of

Carbonate of potaſs, one pound;

Super-tartrite of potaſs, three pounds, or as much as may be ſufficient;

Boiling water, fifteen pounds.

To the carbonate of potaſs diſſolved in the water, gradually add the ſuper-tartrite of potaſs in fine powder, as long as it raiſes any effervеſcence, which generally ceaſes before three times the weight of the carbonate of potaſs has been added; then ſtrain the cooled liquor through paper, and after due evaporation ſet it aſide to cryſtallize.

KALI TARTARISATUM. *Lond.*
Tartariſed Kali.

Take of
Prepared kali, one pound;
Cryſtals of tartar, three pounds;
Diſtilled water, boiling, one gallon.

To the ſalt, diſſolved in the water, throw in gradually the cryſtals of tartar powdered: filter the liquor, when cold, through paper; and, after due evaporation by a gentle heat, ſet it apart to cryſtallize.

ALKALI VEGETABILE TARTARISATUM. *Dub.*
Tartariſed Vegetable Alkali.

Take of
Mild vegetable alkali, one pound;
Cryſtals of tartar in very fine powder, two pounds and a half.
Boiling water, fifteen pounds.

Gradually add the tartar to the vegetable alkali diſſolved in the water; after the liquor has cooled, ſtrain it through paper, evaporate it, and let it cryſtallize by cooling ſlowly.

THE tartaric acid is capable of uniting with potaſs in two proportions, forming in the one inſtance a neutral, and in the other an acidulous ſalt. The latter is an abundant production of nature, but it is eaſily converted into the former, by ſaturating it with potaſs, or by depriving it of its exceſs of acid. It is by the former method that the colleges direct tartrate of potaſs to be prepared, and the proceſs is ſo ſimple, that it requires little comment. For the ſake of economy, we ſhould come as near the point of ſaturation as poſſible; but any ſlight deviation from it will not be attended with much inconvenience. Indeed, it is perhaps adviſable to leave a ſlight exceſs of acid, which, forming a ſmall quantity of very inſoluble ſalt, leaves the remainder perfectly neutral. The evaporation muſt be conducted in an earthen veſſel, for iron diſcolours the ſalt. It is eaſily cryſtallized, and the cryſtals become moiſt in the air. It has an unpleaſant bitter taſte. It is ſoluble in four parts of cold water, and ſtill more ſoluble in boiling water, and it is alſo ſoluble in alcohol. It is totally or partially decompoſed by all acids. On this account it is improper to join it with tamarinds, or other acid fruits; which is too often done in the extemporaneous practice of thoſe phyſicians who are fond of mixing different cathartics together, and know little of chemiſtry. It is alſo totally decompoſed by lime, baryta, ſtrontia, and magneſia, and partially by the ſulphates of potaſs, ſoda, and magneſia, and by the muriate of ammonia.

Medical uſe.—In doſes of a ſcruple, half a drachm, or a drachm, this ſalt is a mild cooling aperient: two or three drachms commonly looſen the belly; and an ounce proves pretty ſtrongly purgative. It has been particularly recommended as a purgative for maniacal and melancholic patients. It is an uſeful addition to the purgatives of the reſinous kind, as it promotes their operation, and at the ſame time tends to correct their griping quality.

CARBONAS SODÆ; olim, SAL ALKALINUS FIXUS FOSSILIS PURIFICATUS. *Ed.*

Carbonate of Soda, formerly *Purified Fixed Foſſil Alkaline Salt.*

Take of

Impure carbonate of ſoda, any quantity.

Bruiſe it; then boil in water till all the ſalt be diſſolved. Strain the ſolution through paper, and evaporate it in an iron veſſel, ſo that after it has cooled, the ſalt may cryſtallize.

NATRON PRÆPARATUM. *Lond.*

Prepared Natron.

Take of

Barilla, powdered, two pounds;
Diſtilled water, one gallon.

Boil the barilla in four pints of water for half an hour, and ſtrain. Boil the reſiduum with the reſt of the water, and ſtrain. Evaporate the mixed liquors to two pints, and ſet them by for eight days; ſtrain this liquor again: and, after due boiling, ſet it aſide to cryſtallize. Diſſolve the cryſtals in diſtilled water; ſtrain the ſolution, boil, and ſet it aſide to cryſtallize.

ALKALI FOSSILE MITE. *Dub.*

Mild Foſſil Alkali.

Take of

Barilla, in powder, ten pounds;
Water, forty pounds.

Boil the barilla in the water, in a covered veſſel, for two hours, agitating it from time to time. Evaporate the filtered ſolution in a wide iron veſſel to dryneſs, taking care that the ſaline maſs remaining be not liquefied by too great a degree of heat, and agitate it with an iron ſpatula, until its colour become white. Laſtly, diſſolve it in boiling water; evaporate, and let it cryſtallize by ſlow refrigeration.

If the ſalt be not pure, repeat the ſolution and cryſtallization.

These directions are principally intended for the purification of the Spaniſh barilla, which is a fuſed maſs, conſiſting indeed principally of carbonate of ſoda, but alſo containing charcoal, earths, and other ſalts. From the two firſt cauſes of impurity it is eaſily ſeparated by ſolution and filtration, and the ſalts may be ſeparated by taking advantage of their different ſolubility in cold and in hot water. Frequently the ſoda does not cryſtallize freely, from not being ſaturated with carbonic acid, which is the reaſon why the London college order the ſolution to be expoſed to the atmoſphere for eight days, that it may abſorb carbonic acid, before they attempt the cryſtallization of the ſalts. But the preparation of carbonate of ſoda, by the decompoſition of ſulphate of ſoda, has now become a manufacture, and is carried to ſuch perfection, that its farther purification is almoſt unneceſſary for the purpoſes of the apothecary.

Off. prep.—Aqua ſuper-carb. ſodæ, *Ed.* Phoſphas ſodæ, *Ed.* Tartris pot. et ſod. *Ed. Lond. Dub.* Carbonas ferri præcip. *Ed.*

AQUA SUPER CARBONATIS SODÆ. *Ed.*
Water of Super-Carbonate of Soda.

This is prepared from ten pounds of water, and two ounces of carbonate of ſoda, in the ſame manner as the water of ſuper-carbonate of potaſs.

By ſuper-ſaturating ſoda with carbonic acid, it is rendered more agreeable to the palate, and may be taken in larger quantities, without affecting the ſtomach.

PHOSPHAS SODÆ. *Ed.*
Phoſphate of Soda.

Take of

Bones burnt to whiteneſs, and powdered, ten pounds;
Sulphuric acid, ſix pounds;
Water, nine pounds.

Mix the powder with the ſulphuric acid in an earthen veſſel; then add the water, and mix again. Then place the veſſel in a vapour bath, and digeſt for three days; after which dilute the maſs with nine pounds more of boiling water, and ſtrain the liquor through a ſtrong linen cloth, pouring over it boiling water, in ſmall quantities at a time, until the whole acid be waſhed out. Set by the ſtrained liquor, that the impurities may ſubſide, decant the clear ſolution, and evaporate it to nine pounds. To this liquor, poured from the impurities, add carbonate of ſoda, diſſolved in warm water, until the effervеſcence ceaſe. Filter the neutralized liquor, and ſet it aſide to cryſtallize. To the liquor that remains after the cryſtals are taken out, add a little carbonate of ſoda, if neceſſary, ſo as to ſaturate exactly the phoſphoric acid, and diſpoſe the liquor, by evaporation to form cryſtals. Laſtly, the cryſtals are to be kept in a well-cloſed veſſel.

The firſt part of this proceſs conſiſts in deſtroying the gelatine of the bones by the action of heat. When burnt to perfect whiteneſs, they retain their form, but become friable, and conſiſt of phoſphate of lime, mixed with a very little carbonate of lime and carbonate of ſoda. In performing this part of the proceſs, we muſt take care not to heat the bones to a bright red, as by it they undergo a kind of ſemi-fuſion, and give out a phoſphoric light. The complete combuſtion of the charcoal is facilitated by the free contact of the air; we muſt therefore bring every part in ſucceſſion to the ſurface, and break the larger pieces.

In the ſecond part of the proceſs, the phoſphate of lime is decompoſed by the ſulphuric acid. This decompoſition is however only partial. The ſulphuric acid combines with part of the lime, and forms inſoluble ſulphate of lime. The phoſphoric acid ſeparated from that portion of lime, immediately combines with the reſt of the phoſphate of lime, and forms ſuper-phoſphate of lime, which is not farther decompoſable by ſulphuric acid.

The ſuper-phoſphate of lime, thus formed, is ſoluble in water: but as the ſulphate of lime, with which it is mixed, concretes into a very ſolid maſs, it is in ſome meaſure defended from the action of water. On this account the whole maſs is directed to be digeſted for three days in vapour, by which means it is throughly penetrated and prepared for ſolution in the boiling water, which is afterwards poured on it. It is probably to render the ſubſequent ſolution eaſier, that Thenard directs the bone-aſhes to be made into a thin paſte (*bouillie*) with water, before the ſulphuric acid is added to them.

Having thus got a ſolution of ſuper-phoſphate of lime, it is next decompoſed by carbonate of ſoda, diſſolved in water. This decompoſition, likewiſe, is only partial, as it deprives the ſuper-phoſphate of lime of its exceſs of acid only, and reduces it to the ſtate of phoſphate. The phoſphate of lime, being inſoluble, is eaſily ſeparated by filtration, and the phoſphate of ſoda remains in ſolution. According to Thenard, the niceſt point in the whole proceſs, is the determination of the proper quantity of carbonate of ſoda to be added. As the phoſphate of ſoda does not cryſtallize freely unleſs there be a ſlight exceſs of baſe, he directs that a little more carbonate of ſoda be added than what is merely ſufficient to ſaturate the exceſs of acid in the ſuper-phoſphate of lime, but not to continue the addition until it ceaſe to produce any precipitate. We muſt alſo take care not to carry the evaporation of a ſolution of phoſphate of ſoda ſo far as to form a pellicle, for it then concretes into an irregular maſs, and does not form beautiful cryſtals. After each cryſtallization, we muſt examine the liquor which remains, and if it be acid, or merely neutral, add to it a little of the ſolution of carbonate of ſoda. In this way Thenard got from 2100 parts of bone-aſhes, 700 of ſulphuric acid, and 667 of carbonate of ſoda, 885 of phoſphate of ſoda. According to Fourcroy, phoſphate of lime conſiſts of 0.41 acid and 0.59 lime, and ſuper-phoſphate of lime of 0.54 acid and 0.46 lime; phoſphate of lime, treated with ſulphuric acid, is only deprived or 0.24 lime, and changed into 0.76 of ſuper-phoſphate, conſiſting of 0.59 phoſphate of lime, and 0.17 phoſphoric acid, and it is only with this portion of acid that we are able to combine ſoda. Fourcroy is alſo of opinion, that phoſphate of lime requires only 0.4 of its weight of ſulphuric acid to decompoſe it, whereas 0.6 are employed by the Edinburgh college, and others uſe even 0.7. This is not only, therefore, a waſte of acid, but renders the product impure, by being mixed with ſulphate of ſoda, which is ſometimes actually the caſe in the phoſphate of ſoda of commerce. Beſides, as bone-aſhes are of a very little value, it is better that a portion of them ſhould eſcape undecompoſed, than that an exceſs of acid ſhould be added to them.

Mr. Funcke, of Linz, has diſcovered a ſtill more economical and expeditious method. It conſiſts in ſaturating the exceſs of lime in calcined bones with diluted ſulphuric acid, and then diſſolving the remaining phoſphate of lime in nitric acid. To this ſolution he adds an equal quantity of ſulphate of ſoda, and then recovers the nitric acid by diſtillation. The phoſphate of ſoda is then ſeparated from the ſulphate of lime, by the affuſion of water and cryſtallization.

Phoſphate of ſoda cryſtallizes in rhomboidal priſms, terminated by three-ſided pyramids. Its taſte reſembles that of common ſalt. At 60° it is ſoluble in four parts of water, and at 212° in two. It effloreſces in the air. By heat it undergoes the watery fuſion, and at laſt melts into a white maſs. It conſiſts, according to Thenard, of 15 phoſphoric acid, 19 ſoda, and 66 water of cryſtallization. It is decompoſed by moſt of the ſalts having an earthy baſe.

Medical uſe.—Phoſphate of ſoda was introduced into the practice of phyſic by the ingenious Dr. Pearſon of Leiceſter ſquare, London. It poſſeſſes the ſame medical qualities as ſulphate of ſoda, and the tartrate of potaſs and ſoda, being an excellent purge in the quantity of an ounce or ten drachms; and has the peculiar advantage over theſe two ſalts of being much leſs nauſeous than they are. Its taſte is extremely ſimilar to that of common ſalt; and when given in a baſon of water-gruel, or veal-broth made without ſalt, it is ſcarcely perceptible by the palate, and conſequently is well adapted for patients whoſe ſtomachs are delicate, and who have an antipathy againſt the other ſalts. The only objection to its general uſe is the very great difference between its price and that of ſulphate of ſoda, a difference which might certainly be diminiſhed.

MURIAS SODÆ EXSICCATUS. *Ed.*
SAL-COMMUNIS EXSICCATUS. *Dub.*
Dried Muriate of Soda, Dried Common Salt.

Take of

Common ſalt, any quantity.

Roaſt it over the fire in a wide iron veſſel, until it ceaſe to decrepitate, agitating it from time to time.

By this proceſs the muriate of ſoda is reduced into the ſtate in which it is employed for the diſtillation of muriatic acid. It not only deprives it entirely of its water of cryſtallization, which, from being variable in quantity, would otherwiſe render the acid obtained unequal in ſtrength, but alſo deſtroys ſome colouring matter it contains; for if we prepare muriatic acid from cryſtallized muriate of ſoda, we obtain a coloured muriatic acid, while the dried muriate furniſhes a perfectly colourleſs one.

Off. prep.—Acid muriat. *Ed. Lond. Dub.* Murias hydrarg. *Ed. Lond. Dub.*

SULPHAS SODÆ; olim, SAL GLAUBERI. *Ed.*
Sulphate of Soda; formerly, *Glaubers Salt.*

Diſſolve the acidulous ſalt which remains after the diſtillation of muriatic acid, in water; and having mixed chalk with it to remove the ſuperfluous acid, ſet it aſide until the ſediment ſubſides, then evaporate the liquor decanted from them, and ſtrain through paper, ſo that it may cryſtallize.

NATRON VITRIOLATUM. *Lond.*
Vitriolated Natron.

Take of

The ſalt which remains after the diſtillation of the muriatic acid, two pounds;

Diſtilled water, two pints and an half.

Burn out the ſuperfluous acid with a ſtrong fire, in an open veſſel; then boil it for a little in the water: ſtrain the ſolution, and ſet it by to cryſtallize.

ALKALI FOSSILE VITRIOLATUM. *Dub.*

Vitriolated Foſſil Alkali.

Reduce the ſalt, which remains after the diſtillation of muriatic acid, to powder, and diſſolve it in a ſufficient quantity of boiling water. Evaporate the filtered ſolution, and cryſtallize the ſalt by ſlow refrigeration.

THE obſervations we made reſpecting the different methods followed by the colleges, for extracting ſulphate of potaſs from the reſiduum of the diſtillation of nitrous acid, apply in the preſent inſtance, except that the Edinburgh college do not preſerve the ſuperabundant acid when preſent, by ſaturating it with carbonate of ſoda, but get rid of it by ſaturating it with carbonate of lime, with which it forms an inſoluble ſulphate of lime. In fact, the price of ſulphate of ſoda is ſo very ſmall, that it would be no economy to uſe carbonate of ſoda to ſaturate the ſuperabundant acid.

By far the greateſt part of the ſulphate of ſoda is obtained from manufacturers, as a reſult of proceſſes performed for the ſake of other ſubſtances, as in the preparation of muriate of ammonia, oxygenized muriatic acid, &c. It may be economically obtained by making into a paſte with a ſufficient quantity of water, eight parts of burnt gypſum, five of clay, and five of muriate of ſoda. This mixture is burnt in a kiln or oven, then ground to powder, diffuſed in a ſufficient quantity of water, and after being ſtrained, is evaporated and cryſtallized.

Sulphate of ſoda cryſtallizes in ſix-ſided priſms, terminated by dihedral ſummits. The cryſtals are often irregular, and their ſides are uſually channelled. Their taſte is at firſt ſalt, and afterwards diſagreeably bitter. They are ſoluble in 2.67 parts of water at 60°, and in 0.8 at 212°. In the air they eflloreſce. They undergo the watery fuſion, and in a red heat melt. They conſiſt of 23.52 ſulphuric acid, 18.48 ſoda, and 58 water; when dried at 700°, of 56 acid and 44 ſoda. It is decompoſed by baryta and potaſs, and ſalts containing theſe baſes, and by the ſalts of ſilver, mercury, and lead.

Medical uſe.—Taken from half an ounce to an ounce, or more, it proves a mild and uſeful purgative; and in ſmaller doſes, largely diluted, a ſerviceable aperient and diuretic. It is commonly given in ſolution, but it may alſo be given in powder, after it has eflloreſced. In this form the doſe muſt be reduced to one half.

TARTRIS POTASSÆ ET SODÆ; olim, SAL RUPELLENSIS. *Ed.*

Tartrite of Potaſs and Soda, formerly *Rochelle Salt.*

It is prepared from the carbonate of ſoda and ſuper-tartrate of potaſs, in the ſame manner as the tartrate of potaſs.

NATRON TARTARISATUM. *Lond.* SAL RUPELLENSIS. *Dub.*
Tartariſed Natron. *Rochelle Salt.*

Take of
Natron, twenty ounces;
Cryſtals of tartar, powdered, two pounds;
Diſtilled water, boiling, ten pints.

Diſſolve the natron in the water, and gradually add the cryſtals of tartar: filter the liquor through paper; evaporate, and ſet it aſide to cryſtallize.

THE tartarc acid in ſeveral inſtances is capable of entering into combination at the ſame time with two baſes. In the preſent example, the ſuperabundant acid of the ſuper-tartrate of potaſs is neutralized with ſoda, and in place of a mixture of tartrate of potaſs and tartrate of ſoda, each poſſeſſing their own properties, there reſults a triple ſalt, having peculiar properties.

The tartrate of potaſs and ſoda forms large and very regular cryſtals, in the form of priſms with eight ſides nearly equal, which are often divided longitudinally, almoſt through their axis. It has a bitter taſte. It is ſoluble in about five parts of water, and effloreſces in the air. It is decompoſed by the ſtrong acids, which combine with the ſoda, and ſeparate ſuper-tartrate of potaſs, and by baryta and lime. By heat its acid is deſtroyed. It conſiſts of 54 tartrate of potaſs, and 46 tartrate of ſoda.

Medical uſe.—It was introduced into medical practice by M. Seignette, an apothecary at Rochelle, whoſe name it long bore. It is ſtill frequently employed; and though leſs agreeable than the phoſphate of ſoda, it is much more ſo than the ſulphate of ſoda. It is leſs purgative than theſe, and muſt be given in larger doſes.

AQUA AMMONIÆ; olim, AQUA AMMONIÆ CAUSTICÆ. *Ed.*
LIQUOR ALKALI VOLATILIS CAUSTICI. (*Dub.*)
Water of Ammonia, formerly *Water of Cauſtic Ammonia.* *Liquor of Cauſtic Volatile Alkali.*

Take of
Muriate of ammonia, ſixteen ounces;
Quicklime, freſh burnt, two pounds;
Water, ſix pounds.

Having put one pound of the water into an iron or ſtoneware veſſel, add the quicklime, previouſly beat, and cover the veſſel for twenty-four hours, until the lime fall into a fine powder, which is to be put into a retort. Add to it the muriate of ammonia, diſſolved in five pounds of water; and, ſhutting the mouth of the retort, mix them together by agitation. Laſtly, diſtil into a refrigerated receiver with a very gentle heat, (ſo that the operator's hand can eaſily bear the heat of the retort), till twenty ounces of liquor are drawn off. In this diſtillation the veſſels are to be ſo luted as to confine effectually the vapours, which are very penetrating. (*Ed.*)

Sprinkle one pound of boiling water upon the lime, placed in a ſtoneware veſſel, and cover up the veſſel. Twenty-four hours afterwards, mix the ſalt with the lime, which will have crumbled to powder, taking care to avoid the vapours. Then put the mixture into a retort, and pour upon it five pounds of water. Having previouſly agitated them, draw off with a moderate heat twenty ounces of liquor into a refrigerated receiver, having luted carefully the joining of the veſſels.

The ſpecific gravity of this liquor is to that of diſtilled water, as 936 to 1000. (*Dub.*)

AQUA AMMONIÆ PURÆ. *Lond.*
Water of Pure Ammonia.

Take of

Sal ammoniac, one pound;
Quicklime, two pounds;
Water, one gallon.

Add to the lime two pints of the water. Let them ſtand together an hour; then add the ſal ammoniac and the other ſix pints of water boiling, and immediately cover the veſſel. Pour out the liquor when cold, and diſtil off with a ſlow fire one pound.

IN this proceſs the muriate of ammonia is decompoſed by the lime, in conſequence of its having a ſtronger affinity for muriatic acid than ammonia has. It is abſolutely neceſſary that the lime employed be very recently burnt, as the preſence of carbonic acid would render the ammonia partially carbonated. This accident is alſo prevented by the great exceſs of lime uſed, which having a greater affinity for carbonic acid than ammonia has, retains any ſmall quantity of it which may be accidentally preſent. The lime is alſo to be ſlaked before it be added to the muriate of ammonia, becauſe the heat produced during its ſlaking would cauſe a violent diſengagement of ammonia gas, and be attended with great loſs. The addition of the water is eſſential to the exiſtence of the ammonia in a liquid form, for in itſelf it is a permanently elaſtic fluid. A much greater quantity of water, however, is uſed than what is ſufficient to abſorb all the ammonia: the reſt is intended to render the decompoſition ſlower and more manageable, and to keep the muriate of lime which remains in the retort in ſolution; for otherwiſe it would concrete into a ſolid maſs, adhering ſtrongly to the bottom of the retort, very difficult to be waſhed out, and often endangering its breaking. As ſoon as the ſlaked lime and muriate of ammonia are mixed, they ſhould be put into the retort, the water poured upon them, and the diſtillation begun: for, by the London proceſs, of adding the water boiling hot to the mixture, and letting it ſtand to cool before it is introduced into the retort, there is a very great loſs of ammonia, and for no reaſon whatever. A very ſmall degree of heat is ſufficient for the diſtillation, and the whole ammonia riſes with the firſt portion of water, or even before it. It is therefore neceſſary that the veſſels be very cloſely luted to each other, to prevent it from eſcaping. But this renders the utmoſt care neceſſary in the diſtillation; for too ſudden, or too great a heat, from the rapid diſengagement of gas, or even the expanſion of the air contained in the veſſels, would endanger their burſting.

Many variations of greater or leſs importance have been made in conducting this proceſs, but the moſt conſiderable is that of Göttling. The peculiarity of his method conſiſts in diſengaging the ammonia in the form of gas, and combining it afterwards with water with the aſſiſtance of preſſure. He uſes an earthen ware cucurbit, with a tubulated capital. To the ſpout of the capital, one end of a bent glaſs tube is accurately luted, while the other end is introduced to the bottom of a tall narrow-mouthed glaſs phial, containing one part of water. Into the cucurbit he puts two parts of finely powdered lime, and one of muriate of ammonia, and then applies the heat. He does not ſhut the tubulature until the ſmell of ammonia becomes manifeſt, and opens it again as ſoon as the proceſs is finiſhed, and before the veſſels begin to cool, as otherwiſe the ſolution of ammonia would flow back into the cucurbit, and ſpoil the whole operation. But this management of the tubulature requires very great attention, and, therefore, we think that this apparatus would be very much improved, by ſubſtituting for the tubulature one of Welter's tubes of ſafety, by which even the poſſibility of ſuch an accident is precluded.

We have already mentioned the properties of ammonia in its gaſeous form, and its relation to the alkalies. When combined with water, it imparts to it many of theſe properties, and leſſens its ſpecific gravity. Liquid ammonia, or water ſaturated with ammonia, contains 74.63 water, and 25.37 ammonia; and its ſpecific gravity is 0.9054. When it has the ſpecific gravity mentioned by the Dublin college 0.936, it contains about 83 of water, and 17 of ammonia. It aſſumes its elaſtic form, and ſeparates from the water, when heated to about 130°, and quickly attracts carbonic acid from the atmoſphere. It decompoſes many of the earthy and all the metalline ſalts, and is capable of diſſolving or combining with many of the metalline oxides, and even of oxidizing ſome of the metals. When pure, water of ammonia does not efferveſce with any of the acids, or form a precipitate with alcohol.

Medical uſe.—Water of ammonia is very rarely given internally, although it may be uſed in doſes of ten to twenty drops, largely diluted, as a powerful ſtimulant in aſphyxia, and ſimilar diſeaſes. Externally it is applied to the ſkin as a rubefacient, and in the form of gas to the noſtrils, and to the eyes as a ſtimulant; in caſes of torpor, paralyſis, rheumatiſm, ſyncope, hyſteria, and chronic ophthalmia.

Off. prep.—Hydroſulph. ammon. *Ed.* Oleum ammon. *Ed. Lond.* Linim camph. comp. *Lond.* Spt. ammon. ſuccinat. *Lond.*

ALCOHOL AMMONIATUM, SIVE SPIRITUS AMMONIÆ. *Edin.*

Ammoniated Alcohol, or *Spirit of Ammonia.*

Take of
- Diluted alcohol, four pounds;
- Muriate of ammonia, four ounces;
- Carbonate of potaſs, ſix ounces.

Mix them, and draw off by diſtillation, with a gentle heat, two pounds.

SPIRITUS AMMONIÆ. *Lond.* SPIRITUS ALKALI VOLATILIS. *Dub.*

Spirit of Ammonia. *Spirit of Volatile Alkali.*

Take of
- Proof ſpirit, three pints;
- Sal ammoniac, four ounces;
- Potaſhes, ſix ounces.

Mix, and diſtil with a ſlow fire, one pint and an half.

WHEN muriate of ammonia is decompoſed by carbonate of potaſs, the product is a mixture of carbonate of ammonia with a variable quantity of ammonia; for the carbonate of potaſs is never ſaturated with carbonic acid. Again, as diluted alcohol is employed in this proceſs, and one half only is drawn off, it is evident that there is either a want of economy, or the whole alcohol comes over before any of the water. But if the latter ſuppoſition be true, there is alſo a want of economy, for the alcohol will diſſolve only the ammonia, and leave the whole carbonate undiſſolved. The fact is, that when we perform the proceſs as directed by the colleges, a very large proportion of carbonate of ammonia ſublimes, which remains undiſſolved in the diſtilled liquor; but as this liquor (after the particles of carbonate of ammonia, which were diffuſed through it, have ſeparated in the form of very regular cryſtals, adhering to the ſides of the veſſel) efferveſces with acids, the diſtilled liquor cannot be pure alcohol, but muſt contain a proportion of water capable of diſſolving ſome carbonate of ammonia. From both conſiderations, it appears to us, that the proceſs directed, if not unchemical, is at leaſt uneconomical.

It is remarkable that the Edinburgh college, for what reaſon we know not, ſhould have adopted, in the two laſt editions of their Pharmacopœia, this proceſs from the London college, and relinquiſhed one which to us appears unexceptionable, as it is not attended with the ſmalleſt loſs, either of alcohol or ammonia, and gives both a more active and a more uniform preparation. A ſtrong proof of its ſuperiority is, that the apothecaries ſtill continue to follow it, although it has been rejected by the college. We ſhall therefore inſert it here without any alteration, except of the nomenclature.

Take of
Quicklime, ſixteen ounces;
Muriate of ammonia, eight ounces;
Alcohol, thirty-two ounces.

Having bruiſed and mixed the quicklime and muriate of ammonia, put them into a glaſs retort; then add the alcohol, and diſtil to dryneſs, in the manner directed for the water of ammonia.

The Berlin college direct this preparation to be made by ſimply mixing two parts of alcohol with one of water of ammonia.

Off. prep.—Alcohol ammon. fœted. *Ed. Dub.* Alcohol ammon. aromat. *Ed. Lond. Dub.* Tinct. caſt. comp. *Ed.* Tinct. guiac. amm. *Ed.* Tinct. opii am. *Ed.*

CARBONAS AMMONIÆ; olim, AMMONIA PRÆPARATA. *Edin.*

Carbonate of Ammonia, formerly *Prepared Ammonia.*

Take of
Muriate of ammonia, one pound;
Pure carbonate of lime, (commonly called chalk), dried, two pounds.

Having triturated them ſeparately, mix them thoroughly, and ſublime from a retort into a refrigerated receiver.

AMMONIA PRÆPARATA. *Lond.* ALKALI VOLATILE MITE. *Dub.*

Prepared Ammonia. Mild Volatile Alkali.

Take of
Sal ammoniac, powdered, one pound.
Prepared chalk, two pounds.

Mix and ſublime. (*Lond.*)

Dry them with the greateſt care; and having mixed them, introduce them into a retort. By means of heat ſublime the alkaline ſalt, which is to be received in a proper veſſel. (*Dub.*)

In this proceſs the two ſubſtances employed undergo a mutual decompoſition, the muriatic acid combining with the lime, and the carbonic acid with the ammonia. The proportion of carbonate of lime directed, is perhaps more than ſufficient to decompoſe the muriate of ammonia; but it is the ſafe ſide to err on; for it is only ſometimes inconvenient, from obliging us to make uſe of larger veſſels, whereas, if any portion of the muriate of ammonia were to remain undecompoſed, it would ſublime along with the carbonate, and render the product impure. Göttling uſes three parts of chalk to two of muriate of ammonia, but he dries his chalk before he weighs it. The chalk is always to be very carefully dried before it is uſed in this preparation, as the preſence of moiſture injures the product. The ingredients are to be thoroughly mixed by trituration, before they are introduced into the retort, that no part of the muriate of ammonia may eſcape decompoſition; and we are even ſometimes directed to cover the ſurface of the mixture, after they are in the retort, with powdered chalk. This, however, is unneceſſary. Carbonate of lime does not act on muriate of ammonia till a conſiderable heat be applied. Göttling ſays, that the ſublimation muſt be conducted in the open fire, and therefore uſes an earthen-ware cucurbit, with a tubulated capital. When a glaſs retort is employed, it ſhould have a very wide neck; and the beſt form for the receiver is cylindrical, as it enables us to get out the carbonate of ammonia condenſed in it without breaking it. The reſiduum which remains in the retort, furniſhes muriate of lime by lixiviation and evaporation.

Sometimes carbonate of potaſs is employed for the preparation of carbonate of ammonia. The theory of the proceſs is the ſame, and the decompoſition is effected at a lower temperature. But as potaſs is very rarely ſaturated with carbonic acid, part of the ammonia is evolved in the form of gas, which, if not permitted to eſcape, will burſt the veſſels. To prevent this loſs, therefore, Mr. Göttling uſes a cucurbit and capital, furniſhed with a bent tube, which is to be immerſed in a phial of water: by which contrivance, while the carbonate of ammonia is condenſed in the capital, the gaſeous ammonia is abſorbed by the water. When potaſs is uſed, the reſiduum contains muriate of potaſs.

Carbonate of ammonia is obtained in the form of a white cryſtallized maſs, of a fibrous texture, having the ſmell and taſte of ammonia, but weaker. It is ſoluble in twice its weight of cold water, and is more ſoluble as the temperature of the water increaſes; but when it approaches to a boiling heat, the carbonate is volatilized. It is inſoluble in alcohol. It is permanent in the air, and is not decompoſed, but is eaſily vaporized by heat. It is ſaid to vary very much in its compoſition, and to contain more ammonia, and leſs acid and water, in proportion to the high temperature employed in preparing it, the quantity of alkali varying from 50 to 20 *per cent.* It is decompoſed by moſt of the acids, and all the alkaline, and ſome of the earthy, baſes; by the earthy ſulphates, except thoſe of baryta and ſtrontia; by the earthy ſulphates, muriates, and fluates; by the nitrates of baryta, and ſuperphoſphate of lime.

Medical uſe.—Carbonate of ammonia exactly reſembles ammonia in its action on the living body; but is weaker, and is principally uſed as ſmelling ſalts in ſyncope and hyſteria.

Off. prep.—Aqua acetitis ammon. *Ed. Lond. Dub.* Ammoniaretum cupri, *Ed. Lond. Dub.*

AQUA CARBONATIS AMMONIÆ; olim, AQUA AMMONIÆ. *Edin.* LIQUOR ALKALI VOLATILIS. *Dub.*

Water of Carbonate of Ammonia, formerly *Water of Ammonia. Liquor of Volatile Alkali.*

Take of

Muriate of ammonia;
Carbonate of potaſs, each ſixteen ounces;
Water, two pounds.

Having mixed the ſalts, and put them in a glaſs retort, pour the water upon them, and diſtil to dryneſs in a ſand bath, gradually increaſing the heat. *Ed.*

Draw off the liquor by diſtillation, until the reſiduum become dry. The ſpecific gravity of this liquor is to that of diſtilled water as 1110 to 1000. *Dub.*

AQUA AMMONIÆ. *Lond.*

Water of Ammonia.

Take of

Sal ammoniac, one pound;
Potaſhes, one pound and a half;
Water, four pints.

Draw off two pints by diſtillation, with a ſlow fire.

THE product of this proceſs is a ſolution of carbonate of ammonia, while the reſiduum in the retort is muriate of potaſs. In this inſtance, the decompoſition of the muriate of ammonia cannot be effected by carbonate of lime, becauſe the addition of the water prevents the application of the neceſſary heat, whereas carbonate of potaſs acts at a moderate temperature. The directions of the London college differ from thoſe of the other colleges in two particulars; in the quantity of water added, and in the proportion of carbonate of potaſs employed. The addition of more water than what is to be drawn off by diſtillation, muſt increaſe the ſize of the apparatus employed, an inconvenience always to be avoided, if poſſible. With regard to the quantity of carbonate of potaſs employed, from calculation and the authority of the beſt writers, for we do not ſpeak from experience, we are diſpoſed to think the London college in the right: for the 42.75 parts of muriatic acid in 100 parts of muriate of ammonia, require 84.12 of potaſs to ſaturate them; but in 100 parts of carbonate of potaſs there are not above 50 parts of potaſs, ſo that carbonate of potaſs is not capable of decompoſing an equal weight of muriate of ammonia. But it is more economical, as well as more ſcientific, to prepare this ſolution by diſſolving a certain proportion of carbonate of ammonia in water.

Off. prep.—Oxid. hyd. ciner. *Ed. Dub.* Linim camph. *Dub.* Pil. ammoniaret cupri, *Ed.*

LIQUOR VOLATILIS, SAL, ET OLEUM CORNU CERVI. *Lond.*

The Volatile Liquor, Salt, and Oil, of Harts-horn.

Take of

Harts-horn, ten pounds.

Diſtil with a fire gradually increaſed. A volatile liquor, ſalt, and oil, will aſcend.

The oil and ſalt being ſeparated, diſtil the liqvor three times.

To the ſalt add an equal weight of prepared chalk, and ſublime thrice, or till it become white.

The ſame volatile liquor, ſalt, and oil, may be obtained from any animal ſubſtance except fat.

LIQUOR VOLATILIS CORNU CERVINI. *Dub.*

Volatile Liquor of Harts-horn.

Take of

Harts-horn, any quantity.

Put it into a retort, and diſtil with a gradually-increaſed heat, the volatile liquor, ſalt, and oil. Then repeat the diſtillation of the volatile liquor until it becomes as limpid as water, ſeparating by filtration the oil and ſalt after each diſtillation.

The ſpecific gravity of this liquor is to that of diſtilled water as 1110 to 1000.

If harts-horn cannot be had, the bones of any other animal may be ſubſtituted for them

The wholeſale dealers have very large pots for this diſtillation, with earthen heads, almoſt like thoſe of the common ſtill; for receivers, they uſe a couple of oil jars, the mouths of which are luted together; the pipe that comes from the head, is connected by means of an adopter with the lower jar, which is alſo furniſhed with a cock for drawing off the fluids condenſed in it. The upper jar is entire, and in it is condenſed the ſolid carbonate of ammonia. When a large quantity of the ſubject is to be diſtilled, it is cuſtomary to continue the operation for ſeveral days ſucceſſively; only unluting the head occaſionally, to put in freſh materials. When the upper jar becomes entirely filled with carbonate of ammonia, it cracks. It is then to be removed, the ſalt to be taken out of it, and a freſh one ſubſtituted in its place.

When only a ſmall quantity of ſpirit or ſalt is wanted, a common iron pot, ſuch as is uſually fixed in ſand furnaces, may be employed; an iron head being fitted to it. The receiver ought to be large, and a glaſs, or rather tin, adopter inſerted between it and the pipe of the head.

The diſtilling veſſel being charged with pieces of horn, a moderate fire is applied, which is ſlowly increaſed, and raiſed at length almoſt to the utmoſt degree. At firſt water ariſes, which gradually acquires colour and ſmell, from the admixture of empyreumatic oil and ammoniacal ſalts; carbonate of ammonia next ariſes, which at firſt diſſolves, as it comes over, in the water, and thus forms what is called the *ſpirit*. When the water is ſaturated, the remainder of the ſalt concretes in a ſolid form to the ſides of the recipient. If it be required to have the whole of the ſalt ſolid, and undiſſolved, the water ſhould be removed as ſoon as the ſalt begins to ariſe, which may be known by the appearance of white fumes; and that this may be done the more commodiouſly, the receiver ſhould be left unluted, till this firſt part of the proceſs be finiſhed. The white vapours which now ariſe, ſometimes come over with ſuch vehemence as to throw off or burſt the receiver: to prevent this accident, it is convenient to have a ſmall hole in the luting, which may be occaſionally ſtopped with a wooden peg, or opened, as the operator ſhall find proper. Laſtly, the oil ariſes, which acquires greater colour and conſiſtency as the operation advances. Carbonate of ammonia ſtill comes over, but it is partly diſſolved in the hot oily vapour. At the ſame time, there is a conſiderable diſengagement of gas, conſiſting of a mixture of carburetted hydrogen, often containing ſulphur and phoſphorus, and of carbonic acid.

All the liquid matters being poured out of the receiver, the ſalt which remains adhering to its ſides, is to be waſhed out with a little water, and added to the reſt. It is convenient to let the whole ſtand for a few hours, that the oil may the better diſengage itſelf from the liquor, ſo as to be firſt ſeparated by a funnel, and afterwards more perfectly by filtration through wet paper.

None of theſe products, except perhaps a ſmall quantity of the water, exiſt ready formed in the matter ſubjected to the diſtillation; but are produced by a new arrangement of its conſtituents. For the production of ammonia, it is abſolutely neceſſary that it contain nitrogen, or be what we have called a quaternary oxide. Although ſome vegetable, and moſt animal ſubſtances, are of this kind, yet only the moſt ſolid parts of animals, ſuch as bone and horn, are employed for the production of ammonia; becauſe they furniſh it leſs mixed with other ſubſtances, are eaſily obtained, and at little expence, and are very manageable in the diſtillation. On the application of heat, as ſoon as all the water which they contained is expelled, their elements begin to act on each other, and to form binary, or at moſt ternary compounds. Water is formed of part of the oxygen and hydrogen, ammonia of nitrogen and hydrogen, carbonic acid of carbon and oxygen, then oil of hydrogen and charcoal, while the ſuperfluous carbon remains in the retort in the ſtate of charcoal. As the formation of theſe ſubſtances is ſimultaneous, or in immediate ſucceſſion, they are not obtained ſeparately, but are mixed with each other. The water is ſaturated with carbonate of ammonia, and impregnated with empyreumatic oil, while the carbonate of ammonia is diſcoloured with oil; and the oil contains carbonate of ammonia diſſolved in it. They may, however, be ſeparated from each other in a great meaſure, in the manner already deſcribed. But a ſmall portion of oil obſtinately adheres both to the ſalts and its ſolution, which conſtitutes the only difference between ſalt and ſpirit of harts-horn, as they are called, and the purer carbonate of ammonia, as obtained by the decompoſition of muriate of ammonia.

AQUA ACETETIS AMMONIÆ; vulgo, SPIRITUS MINDERI. *Edin.* AQUA AMMONIÆ ACETATÆ. *Lond.* LIQUOR ALKALI VOLATILIS ACETATI. *Dub.*

Water of Acetite of Ammonia, commonly called *Spirit of Mindererus.* *Water of Acetated Ammonia. Liquor of Acetated Volatile Alkali.*

Take of
Carbonate of ammonia in powder, any quantity, (two ounces, *Lond. Dub.*)

Pour upon it as much diſtilled acetous acid as may be ſufficient to ſaturate the ammonia exactly. (About four pints, *Lond.* Three pounds and a half. *Dub.*)

By this proceſs we obtain acetate of ammonia, diſſolved in the water of the acetic acid; but as this is apt to vary in quantity, the ſolution alſo varies in ſtrength, and the cryſtallization of the ſalt is attended with too much difficulty to be practiſed for pharmaceutical purpoſes. Its cryſtals are long, ſlender, and flatted, of a pearly white colour, and of a cool ſweetiſh taſte, are very deliqueſcent, melt at 170°, and ſublime at 250°. It is decompoſed by the acids, alkalies, and ſeveral of the the earths, and metalline ſalts; and when in ſolution, its acid is decompoſed ſpontaneouſly, and by heat.

Different propoſals have been made to get a ſolution of greater ſtrength and uniformity, than that ſtill retained by the Britiſh colleges. Mr. Lowe ſaturates four ounces of carbonate of potaſs with diſtilled vinegar, and evaporates the ſolution to 36 ounces. He then mixes it with two ounces of muriate of ammonia, and diſtils the mixture in a glaſs retort. Acetate of ammonia comes over. The laſt edition of the Pruſſian Pharmacopœia prepares it by ſaturating three ounces of carbonate of ammonia with a ſtrong acetic acid, (obtained by diſtillation from acetate of ſoda, diſſolved in two parts of water, and decompoſed by ſulphuric acid), and diluting the ſolution with water, ſo that it ſhall weigh twenty-four ounces. One ounce, therefore, contains the alkali of a drachm of carbonate of ammonia.

Medical uſe.—Acetate of ammonia, when aſſiſted by a warm regimen, proves an excellent and powerful ſudorific; and as it operates without quickening the circulation or increaſing the heat of the body, it is admiſſible in febrile and inflammatory diſeaſes, in which the uſe of ſtimulating ſudorifics are attended with danger. Its action may likewiſe be determined to the kidneys, by walking about in a cool air. The common doſe is half an ounce, either by itſelf, or along with other medicines adapted to the ſame intention.

HYDRO-SULPHURETUM AMMONIÆ. *Edin.*
Hydro-Sulphuret of Ammonia.

Take of

Water of ammonia, four ounces;

Subject it in a chemical apparatus to a ſtream of the gas, which ariſes from

Sulphuret of iron, four ounces,

Muriatic acid, eight ounces, previouſly diluted with two pounds and a half of water.

Sulphuret of Iron is conveniently prepared for this purpoſe, from

Purified filings of iron, three parts;

Sublimed ſulphur, one part.

Mixed and expoſed to a moderate degree of heat in a covered crucible, until they unite into a maſs.

Sulphuretted hydrogen is capable of combining with different baſes in the manner of an acid. In the preſent preparation, it is combined with ammonia. It is obtained by decompoſing ſulphuret of iron with muriatic acid. As ſoon as the acid, by its ſuperior affinity, ſeparates the iron from the ſulphur, the latter immediately re-acts on the water, the oxygen of which forms with one portion of it ſulphuric acid, while the hydrogen diſſolves another portion, and forms ſulphuretted hydrogen gas. The combination of this with ammonia is facilitated by reduction of temperature, and by making it paſs through a column of the water of ammonia by means of an apparatus, ſuch as Woulfe's, or Nooth's. Trommſdorff has propoſed, that the ſulphuretted hydrogen gas ſhould be obtained by the decompoſition of ſulphuret of potaſs; but in this way its formation is too rapid to be eaſily managed. Göttling ſays, that the acid ſhould be added gradually, and that the whole muſt be conſtantly agitated. But theſe precautions are rendered more unneceſſary, by diluting the acid in the degree directed by the pharmacopœia. Mr. Cruickſhank, who firſt ſuggeſted the uſe of hydro-ſulphuret of ammonia in medicine, directs the ſulphuret of iron to be prepared by heating a bar of iron to a white heat in a ſmith's forge, and rubbing againſt the end of it a roll of ſulphur. The iron at this temperature immediately combines with the ſulphur, and forms globules of ſulphuretted iron, which ſhould be received in a veſſel filled with water. It is, however, more conveniently obtained in the manner directed by the college. Prouſt has proved that iron is capable of combining with two proportions of ſulphur. At a high temperature 100 parts of iron combine with 60 of ſulphur, and forms a compound of a dull blackiſh colour. In this ſtate it is fit for the production of ſulphuretted hydrogen gas. At a lower temperature the ſame quantity of iron takes up 90 of ſulphur, acquires a greeniſh yellow colour, and in every reſpect reſembles native pyrites. This cannot be decompoſed by acids, and is therefore unfit for the production of gas; but it may be reduced to the ſtate of iron ſulphuretted to the minimum, by expoſing it to a ſufficiently-high temperature, or by melting it with half its weight of iron filings. It was probably from not attending to the different ſtates of ſulphuretted iron, that ſome of the German chemiſts failed in their attempts to procure from it ſulphuretted hydrogen gas, and had recourſe to ſulphuret of potaſs. As the proportions have been miſ-ſtated in an elementary work of great authority, it may be proper to recapitulate them.

	SULPHURETTED IRON.			SUPER-SULPHURETTED IRON.		
Iron,	100	or	62.5	100	or	52.63
Sulphur,	60		37.5	90		47.37
	160		100	190		100.

Medical uſe.—Hydro-ſulphuret of ammonia, or more correctly, Sulphuretted hydroguret of ammonia, acts powerfully on the living ſyſtem. It induces vertigo, drowſineſs, nauſea, and vomiting, and leſſens the action of the heart and arteries. It therefore ſeems to be a direct ſedative. According to the doctrine of the chemical phyſiologiſts, it is a powerful diſoxygenizing remedy. It has only been uſed in diabetes by Dr. Rollo and others, under the name of Hepatized ammonia, in doſes of five or ten drops twice or thrice a-day.

CHAP. IV.

EARTHS, AND EARTHY SALTS.

MURIAS BARYTÆ. *Edin.*

Muriate of Baryta.

Take of
  Sulphate of baryta, two pounds;
  Charcoal of wood, in powder, four ounces.

Roaſt the ſulphate with fire, that it may be more eaſily reduced to a very fine powder, with which the charcoal is to be intimately mixed. Put the mixture into a crucible, and having fitted it with a cover, heat it with a ſtrong fire for ſix hours. Then triturate the matter well, and throw it into ſix pounds of water in an earthen or glaſs veſſel, and mix them by agitation, preventing as much as poſſible the action of the air.

Let the veſſel ſtand in a vapour bath until the part not diſſolved ſhall ſubſide, then pour off the liquor. On the undiſſolved part pour four pounds more of boiling water, which, after agitation and depoſition, are to be added to the former liquor. Into the liquor, when ſtill warm, or if it ſhall have cooled, again heated, drop muriatic acid as long as it excites any effervеſcence. Then ſtrain it and evaporate it ſo as to cryſtallize.

In the materia medica of the Edinburgh college, the carbonate of baryta is introduced, for the purpoſe of forming the muriate; but as that mineral is not very common, and ſometimes not to be procured, it became neceſſary to deſcribe the manner of preparing the muriate from the ſulphate. This is, however, attended with very conſiderable difficulties, on account of the very ſtrong attraction which ſubſiſts betweeen the ſulphuric acid and baryta.

The ſulphate of baryta may be decompoſed,

1. By compound affinity; by means of carbonate of potaſs or muriate of lime.

Carbonate of potaſs is capable of effecting this decompoſition, either in the dry or humid way. Klaproth boils ſixteen ounces of finely-powdered ſulphate of baryta with 32 ounces of purified carbonate of potaſs, and five pounds of water, for an hour in a tin kettle, conſtantly agitating the mixture, and renewing the water as it evaporates. He then allows it to ſettle, pours off the fluid, which is a ſolution of ſulphate of potaſs, and edulcorates the precipitate with plenty of water. He next diſſolves the carbonate of baryta, which it contains, in muriatic acid. The portion of ſulphate which is not decompoſed, may be treated again in the ſame manner.

On the other hand, Van Mons mixes equal parts of ſulphate of baryta and carbonate of potaſs with one fourth of their weight of charcoal all in powder, and heats the mixture to redneſs in a crucible. When it cools he waſhes out the ſulphate and ſulphuret of potaſs with water, then boils the reſiduum with a little potaſs, and waſhes it again. The carbonate of baryta thus obtained, he diſſolves in muriatic acid.

But by theſe methods of decompoſing the ſulphate of baryta, we do not get rid of the metallic ſubſtances which it often contains, and which often render the muriate thus prepared unfit for medical uſe. But the metalline muriates may be expelled, according to Weſtrumb, by heating the ſalt to redneſs as long as any fumes ariſe. The pure muriate of baryta is then to be diſſolved in water and cryſtallized. Göttling, with the ſame intention of getting rid of metalline ſubſtances, chooſes ſulphate of baryta, perfectly colourleſs, and treats it with muriatic or nitro-muriatic acid before he proceeds to decompoſe it.

La Grange has propoſed a new method of decompoſing the ſulphate of baryta, by means of muriate of lime, which he prepares from the reſiduum of the decompoſition of muriate of ammonia by lime, by diſſolving it in a ſmall quantity of hot water, and evaporating it to dryneſs. He mixes equal parts of this muriate with ſulphate of baryta in powder, and projects it by ſpoonfuls into a crucible previouſly heated to redneſs. When it is all in complete fuſion, he pours it out upon a poliſhed ſtone previouſly heated. The matter, which cracks as it cools, has a whitiſh-grey colour, is very hard, ſonorous, and deliqueſcent, is now to be boiled in about ſix times its weight of diſtilled water, its ſolution filtered, and the reſiduum boiled in a ſmaller quantity of water. The mixed ſolutions are then evaporated to a pellicle, and on cooling furniſh beautiful cryſtals of muriate of baryta, which are to be waſhed with cold water, and purified by a ſecond ſolution and cryſtallization. The mother water of the firſt cryſtallization ſtill contains muriate of baryta, which may be ſeparated from the muriate of lime, with which it is mixed, by repeated ſolutions and cryſtallizations. La Grange thinks that this proceſs not only ſaves time, fuel, and muriatic acid, but that it furniſhes a purer muriate of baryta than the following proceſs.

2. By decompoſing its acid; by means of charcoal.

The acid of the ſulphate of baryta is decompoſed at a very high temperature by charcoal. At ſuch a temperature charcoal has a greater affinity for oxygen than ſulphur has; it therefore decompoſes ſulphuric acid, by depriving it of its oxygen, and flies off in the ſtate of carbonic oxide or acid gas, while the ſulphur combines with the baryta. On adding water to the ſulphuret thus formed, new combinations take place. A portion of ſulphate of baryta is regenerated, while hydroguretted ſulphuret, and ſulphuretted hydroguret of baryta remain in ſolution. This ſolution is exceedingly prone to decompoſition, and muſt therefore be preſerved from the action of the air as much as poſſible. It alſo cryſtallizes by cooling, and therefore ſhould be kept at a boiling heat. On the addition of muriatic acid, there is a violent effervеſcence and diſengagement of ſulphuretted hydrogen gas, which muſt be avoided as much as poſſible, by performing the operation under a chimney, while very pure muriate of baryta remains in ſolution. When prepared in this way, it cannot be contaminated with any of the noxious metals, as their compounds with ſulphur and hydrogen are not ſoluble. On this account, therefore, it is the proceſs adopted by the Edinburgh college.

Muriate of baryta commonly cryſtallizes in tables. It has a diſagreeable bitter taſte; is ſoluble in five parts of water at 60°, and in leſs boiling water. It is ſcarcely ſoluble in alcohol; and its ſolution burns with a yellow flame. It cryſtallizes by evaporation; its cryſtals are permanent; and by the action of heat decrepitate, dry, and melt. When cryſtallized it contains 20 acid, 64 baryta and 16 water; when dried, 23.8 acid, and 76.2 baryta. It is decompoſed by the ſulphates, nitrates, and ſulphites; and by the alkaline phoſphates, borates, and carbonates. When pure it has no colour; does not deliqueſce; does not burn with a red or purple flame when diſſolved in alcohol; and is not precipitated by gallic acid, pruſſiate of potaſs and iron, or hydro-ſulphuret of ammonia. By waſhing with alcohol muriate of baryta rendered impure by the preſence of muriate of iron, the latter alone is diſſolved.

It is commonly given in ſolution.

SOLUTIO MURIATIS BARYTÆ. *Edin.*

Solution of Muriate of Baryta.

Take of
Muriate of baryta, one part;
Diſtilled water, three parts. Diſſolve.

The proportion of water directed here for the ſolution of muriate of baryta, is conſiderably leſs than what is ſtated to be neceſſary by the writers on chemiſtry. It is however ſufficient, even at the loweſt ordinary temperatures; a circumſtance which ſhould be attended to in making ſaturated ſolutions of ſaline bodies.

Medical uſe.—Muriate of baryta is generally ſaid by writers on the materia medica to be a *ſtimulant* deobſtruent; and yet Hufeland, one of its greateſt ſupporters, ſays, that it ſucceeds better in caſes attended with inflammation and increaſed irritability than with atony and torpor. When given in large doſes, it certainly produces nauſea, vomiting, diarrhœa, vertigo, and death.

Its effects on a morbid ſtate of the body are alſo diſputed. Some aſſert that it is of advantage in no diſeaſe; while others beſtow upon it the moſt unqualified praiſes. By the latter, it is principally celebrated,

1. In all caſes of ſcrofula.
2. In obſtructions and tumors.
3. In caſes of worms.
4. In cutaneous diſeaſes.

The doſe of the ſolution at firſt, is five or ten drops twice or thrice a-day, to be gradually and cautiouſly increaſed to as much as the patient can bear.

The ſolution is alſo uſed externally as a ſtimulating and gently-eſcharotic application in cutaneous diſeaſes, fungous ulcers, and ſpecks upon the cornea.

AQUA CALCIS. *Edin.*

Lime Water.

Take of
Freſh-burnt lime, half a pound;
Put it into an earthen veſſel, and gradually ſprinkle on it four ounces of water, keeping the veſſel ſhut, while the lime grows hot, and falls into powder. Then pour on it twelve pounds of water, and mix the lime thoroughly with the water by agitation. After the lime has ſubſided, repeat the agitation; and let this be done about ten times, always keeping the veſſel ſhut, that the free acceſs of the air may be prevented. Laſtly, let the water be filtered through paper, placed in a funnel, with glaſs

rods interpoſed between them, that the water may paſs as quickly as poſſible. It muſt be kept in very cloſe bottles.

Lond.

Take of
Quicklime, half a pound;
Boiling diſtilled water, twelve pints.

Mix and ſet them aſide in a covered veſſel for an hour; then pour off the liquor, which is to be kept in a cloſe-ſtopt veſſel.

Dub.

Take of
Lime recently burnt;
Boiling water, each one pound.

Put the lime into an earthen veſſel, and ſprinkle the water upon it, keeping the veſſel ſhut while the lime grows warm and falls into powder; then pour upon it twelve pounds of water, and ſhut the veſſel, agitating it frequently for twenty-four hours; laſtly, filter the water through paper, placed in a covered funnel, and keep it in well-cloſed bottles.

We have already had occaſion to ſpeak of the properties of lime, and ſhall therefore now confine our remarks to the ſolution of it in water, commonly called Lime-water. In making this, we ſhould firſt add only ſo much water as is ſufficient to ſlake the lime, which reduces it to a fine powder, eaſily diffuſed through water; for if we add more water at firſt, it forms a paſte with the external part of the lime, and defends the internal from the action of the water. During the whole proceſs, the air muſt be excluded as much as poſſible; as lime has a very ſtrong affinity for carbonic acid, and attracts it from the atmoſphere. The proportion of water uſed is ſcarcely able to diſſolve one tenth of the lime; but lime is of little value; and our object is to form a ſaturated ſolution quickly and eaſily. Lime is not more ſoluble in hot water than in cold; therefore it is unneceſſary to uſe boiling water. The London college decant their ſolution from the undiſſolved lime; but in this way we are not ſo ſure of a perfectly-tranſparent ſolution as by filtration; and if we uſe the precautions directed by the other colleges, it may be performed without the lime abſorbing a perceptible quantity of carbonic acid. The bottles in which lime-water is kept, ſhould be perfectly full, and well corked.

Lime-water is tranſparent and colourleſs. It has an auſtere acrid taſte, and affects vegetable colours as the alkalies do. It enters very readily into combination with all the acids, ſulphur, and phoſphorus; and decompoſes the alkaline carbonates, phoſphates, fluates, borates, oxalates, tartrates, and citrates.

Medical uſe.—When applied to the living fibre, lime-water corrugates and ſhortens it; it therefore poſſeſſes aſtringent powers. It is alſo a powerful antacid, or at leaſt it combines with and neutralizes acids when it comes in contact with them. It alſo diſſolves mucus, and kills inteſtinal worms. From poſſeſſing theſe properties, it is uſed in medicine, in diſeaſes ſuppoſed to ariſe from laxity and debility of the ſolids, as diarrhœa, diabetes, leucorrhœa, ſcrofula, and ſcurvy; in affections of the ſtomach accompanied with acidity and flatulence; when the inteſtines are loaded with mucus; and in worms. Lime-water is ſcarcely capable of diſſolving, even out of the body, any of the ſubſtances of which urinary calculi conſiſt; it has therefore no pretenſions to the character of a lithontriptic. It has been alſo recommended in cruſta lactea, in cancer, and in chronic cutaneous diſeaſes. Externally, it is applied to ill-conditioned ulcers, gangrenous ſores; as a waſh in tinea capitis and pſora; and as an injection in gonorrhœa, fiſtulas, and ulcers of the bladder.

When taken internally, its taſte is ſaid to be beſt covered by lukewarm milk. Its doſe is commonly from two to four ounces, frequently repeated; but when long continued it weakens the organs of digeſtion.

Off. prep.—Liquor cupri ammoniati, *Lond. Dub.* Oleum lini cum calce, *Ed.*

CARBONAS CALCIS PRÆPARATUS; olim, CRETA PRÆPARATA, ET CANCRORUM LAPILLI; vulgo, OCULI CANCRORUM PRÆPARATI. *Edin.*

Prepared Carbonate of Lime; formerly *Prepared Chalk, and Crabs Stones, commonly called Crabs Eyes.*

CARBONATE of lime, whether the ſofter variety commonly called Chalk, or the harder variety called Crabs Eyes and Crabs Stones, after having been triturated to powder in an iron mortar, and levigated on a porphyry ſtone with a little water, is to be put into a large veſſel, and water to be poured upon it, which after agitating the veſſel repeatedly is to be again poured off, while loaded with minute powder. On allowing the water to ſettle, a ſubtile powder will ſubſide, which is to be dried.

The coarſe powder which the water could not ſuſpend, may be levigated again and treated in the ſame manner.

QUORUNDAM, AQUA NON SOLUBILIUM, PRÆPARATIO. *ond.*

The Preparation of ſome Subſtances not ſoluble in Water.

Reduce theſe ſubſtances firſt in a mortar to powder; and pouring on a little water, levigate them on a hard and poliſhed, but not calcareous, ſtone, that they may be made as fine as poſſible. Dry this powder on blotting-paper laid on chalk, and ſet it in a warm, or at leaſt a dry, place, for ſome days.

In this manner are to be prepared,

Chalk,
Coral,
Crabs claws, firſt broken into ſmall pieces, and waſhed with boiling water,
Oyſter-ſhells, firſt cleaned from impurities,
And alſo amber, antimony, calamine, tutty, and verdegris.

CANCRORUM CHELÆ PRÆPARATÆ. *Dub.*

Prepared Crabs Claws.

Waſh the powdered claws in water mixed with about a ſixth part of cauſtic ley, until the adhering ſaline and animal particles be entirely ſeparated from the earthy particles, which are to be waſhed by frequently pouring upon them boiling water. With the addition of a little water, they are then to be ground in a ſtone-ware mortar to powder, which is to be mixed by agitation with a ſufficiently large quantity of water. After a ſhort delay, that is, until the coarſer particles ſubſide, the liquor is to be poured off. The ſame proceſs, by repeating the trituration, may be performed ſeveral times. Laſtly, the very minute powder ſwimming in the water poured off, is to be collected after it has ſubſided, and dried upon paper placed on a bibulous ſtone.

CRETA PRÆPARATA.	*Prepared Chalk.*
OSTREARUM TESTÆ PRÆPARATÆ.	*Prepared Oyſter-ſhells.*
OVORUM TESTÆ PRÆPARATÆ.	*Prepared Egg-ſhells.*

Theſe are all to be prepared in the ſame way as crabs claws.

THE preparation of theſe ſubſtances merely conſiſts in reducing them to an impalpable powder. The ſolution of potaſs is uſed by the Dublin college to diſſolve the animal matter contained in the different ſhells; which is apt to keep the carbonate of lime too long ſuſpended, and to give it a bad ſmell if not quickly dried. But theſe inconveniences are totally avoided by uſing chalk, which, as a medicine, is not inferior to the coſtly coral.

Medical uſe.—Carbonate of lime is commonly called an Abſorbent Earth. It certainly is an antacid; that is, it combines with and neutralizes moſt acids, while its carbonic acid is expelled in the form of gas. It is therefore exhibited in affections of the ſtomach accompanied with acidity, eſpecially when at the ſame time there is a tendency to diarrhœa. The fear of its forming concretions in the bowels, is probably imaginary; for it is not warranted either by theory or experience.

Applied externally, carbonate of lime may be conſidered as an abſorbent in another point of view; for its beneficial action on burns and ulcers, probably ariſes entirely from its imbibing the moiſture or ichorous matter, as a ſpunge would do, and thus preventing it from acting on the abraded ſurfaces, and excoriating the neighbouring parts.

Off. prep.—Hydrarg. cum creta, *Lond.* Pulv. carb. calcis comp. *Ed. Lond.* Pulv. opiat. *Ed.* Trochiſci carb. calcis, *Ed. Lond.*

SOLUTIO MURIATIS CALCIS. *Edin.*

Solution of Muriate of Lime.

Take of
- Pure carbonate of lime, that is, white marble, broken into pieces, nine ounces;
- Muriatic acid, ſixteen ounces;
- Water, eight ounces.

Mix the acid with the water, and gradually add the pieces of carbonate of lime. When the effervescence has ceaſed, digeſt them for an hour, pour off the liquor, and evaporate it to dryneſs. Diſſolve the reſiduum in its weight and a half of water, and laſtly, filter the ſolution.

From the difficulty of cryſtallizing this ſalt, it is directed to be evaporated to the total expulſion of its water of cryſtallization, as being the ſureſt way of obtaining a ſolution of it of uniform ſtrength.

Its cryſtals are priſms of ſix ſmooth and equal ſides, but they are often ſo aggregated, that they can only be termed acicular. Its taſte is pungent, bitter, and diſagreeable. When heated, it melts, ſwells, and loſes its water of cryſtallization, and at a very high temperature a ſmall part of its acid. It is one of the moſt deliqueſcent ſalts that we know, and is ſo ſoluble in water, that that fluid ſeems capable of diſſolving twice its weight, or at leaſt forms with it a viſcid liquid; but as it is ſtill capable of attracting moiſture from the air, and of emitting caloric when farther diluted, it can ſcarcely be conſidered as a true ſolution. It is ſoluble in alcohol, and its ſolution burns with a crimſon flame. It is decompoſed by the ſulphuric, nitric, phoſphoric, fluoric and boracic acids; by baryta, potaſs, ſoda, and ſtrontia; by moſt of the ſulphates, ſulphites, nitrates, phoſphates, fluates, borates, and the alkaline carbonates. Cryſtallized, it contains 31 acid, 44 lime, and 25 water; dried at a red heat, 42 acid, 50 lime, and 8 water.

Medical uſe.—It was firſt propoſed as a medicine by Fourcroy, in ſcrofulous and glandular diſeaſes, and has been lately extolled by Dr. Beddoes in the ſame affections. A drachm diluted with an ounce of water he conſiders as a medium doſe. In an overdoſe it has produced qualms and ſickneſs; and three drachms and a half killed a dog, the ſtomach of which, upon diſſection, had its villous coat bloodſhot, and in many parts almoſt black and converted into a gelatinous ſlime. The property of this ſalt, of producing intenſe cold during its ſolution, might alſo be applied to medical uſe. For this purpoſe, it might be economically prepared, by ſaturating with muriatic acid the reſiduum of the diſtillation of ammonia or of carbonate of ammonia.

PHOSPHAS CALCIS. Cornu Cervi Ustio. *Lond.* Cornu Cervinum Ustum. *Dub.*

Phoſphate of Lime. Burnt Hartſhorn.

Burn pieces of hartſhorn till they become perfectly white; then reduce them to a very fine powder.

The pieces of horn generally employed in this operation, are thoſe left after diſtillation.

In the burning of hartſhorn, a ſufficient fire and the free admiſſion of air are neceſſary. The potter's furnace was formerly directed for the ſake of convenience; but any common furnace or ſtove will do. Indeed too violent a heat makes their ſurface undergo a kind of fuſion and vitrification, which both prevents the internal parts from being completely burnt, and renders the whole leſs ſoluble. If the pieces of horn be laid on ſome lighted charcoal, ſpread on the bottom of the grate, they will be burnt to whiteneſs, ſtill retaining their original form.

According to the analyſis of Merat Guillot, hartſhorn was found to conſiſt of 27. gelatine, 57.5 phoſphate of lime, 1. carbonate of lime, and there was a loſs of 14.5, probably water. Now, as the gelatine is deſtroyed by burning, and the water expelled, the ſubſtance which remains is phoſphate of lime, mixed with leſs than two *per cent.* of carbonate of lime. The bones of animals have lately been diſcovered to contain phoſphate of magneſia.

Medical uſe.—From its white earthy appearance, it was formerly conſidered as an abſorbent earth. But ſince it has been accurately analyzed, that idea has been laid aſide, and its uſe has been ſuggeſted as a remedy in rickets, a diſeaſe in which the deficiency of the natural depoſition of phoſphate of lime in the bones ſeems to be the eſſential or at leaſt moſt ſtriking ſymptom. M. Bonhomme, therefore, gave it to the extent of half a ſcruple, mixed with phoſphate of ſoda, in ſeveral caſes with apparent ſucceſs. Whatever objections may be made to his theory, the practice certainly deſerves a trial.

Off. prep.—Decoct. cornu cervi, *Lond.* Pulv. opiatus, *Lond.* Phoſphas ſodæ, *Ed.*

MAGNESIA; olim, MAGNESIA USTA. *Ed.*
Magneſia, formerly *Calcined Magneſia.*

Let carbonate of magneſia, put into a crucible, be kept in a red heat for two hours, then put it up in cloſe ſtopt glaſs veſſels.

MAGNESIA USTA. *Lond. Dub.*
Calcined Magneſia.

Take of
White magneſia, four ounces.

Expoſe it to a ſtrong heat for two hours; and, when cold, ſet it by. Keep it in a glaſs veſſel cloſely ſtopt.

BY this proceſs the carbonate of magneſia is freed of its acid and water; and, according to the late Dr. Black's experiment, loſes about $\frac{7}{12}$ of its weight. A kind of opaque foggy vapour is obſerved to eſcape during the calcination, which is nothing elſe than a quantity of fine particles of magneſia, buoyed off along with a ſtream of the diſengaged gas. About the end of the operation, the magneſia exhibits a kind of luminous or phoſphoreſcent property, which may be conſidered as a pretty exact criterion of its being deprived of its acid.

It is to be kept in cloſe veſſels, becauſe it attracts, though ſlowly, the carbonic acid of the atmoſphere.

We have already noticed its general chemical properties.

Med. uſe.—It is uſed for the ſame general purpoſes as the carbonate. In certain affections of the ſtomach, accompanied with much flatulence, magneſia is preferable, both becauſe it contains more magneſia in a given bulk, and, being deprived of its acid, it neutralizes the acid of the ſtomach, without any extrication of gas, which is often a troubleſome conſequence when carbonate of magneſia is employed in theſe complaints.

Off. prep.—Trochiſci mag. *Lond.*

CARBONAS MAGNESIÆ; olim, MAGNESIA ALBA. *Ed.*
Carbonate of Magneſia, formerly *Magneſia Alba.*

Take of
Sulphate of magneſia,
Carbonate of potaſs, equal weights.

Diſſolve them ſeparately in double their quantity of warm water, and let the liquors be ſtrained or otherwiſe freed from their feces: then mix them, and inſtantly add eight times their quantity of warm water. Let the liquor boil for a little on the fire, ſtirring it at the ſame time; then let it reſt till the heat be ſomewhat diminiſhed; after which ſtrain it through linen: the carbonate of magneſia will remain upon the cloth, and it is to be waſhed with pure water till it become altogether void of ſaline taſte.

MAGNESIA ALBA. *Lond. Dub.*

White Magneſia.

Take of

Vitriolated magneſia,
Prepared kali, each two pounds;
Diſtilled water, boiling, twenty pints.

Diſſolve the vitriolated magneſia and prepared kali ſeparately, each in ten pints of water, and filter through paper; then mix them. Boil the liquor a little while, and ſtrain it whilſt hot through linen, (ſtretched ſo as to fit it for collecting the magneſia, *Dub.*) upon which will remain the white magneſia; then waſh away, by repeated affuſions of diſtilled water, the vitriolated kali.

IN this proceſs there is a mutual decompoſition of the two ſalts employed. The potaſs unites itſelf to the ſulphuric acid, while the carbonic acid combines with the magneſia. The large quantity of water uſed is neceſſary for the ſolution of the ſulphate of potaſs formed; and the boiling is indiſpenſably requiſite for the expulſion of a portion of the carbonic acid, which retains a part of the magneſia in ſolution. Sulphate of potaſs may be obtained from the liquor which paſſes through the filter, by evaporation. This is not pure, however, but mixed with undecompoſed carbonate of potaſs; for 100 parts of cryſtallized carbonate of potaſs are ſufficient for the decompoſition of 125 parts of ſulphate of magneſia; and as the carbonate of potaſs of commerce contains a larger proportion of alkali than the cryſtallized carbonate, a ſtill leſs proportion ſhould be uſed. From theſe quantities about 45 parts of carbonate of magneſia are obtained.

The ablutions ſhould be made with very pure water; for nicer purpoſes diſtilled water may be uſed, and ſoft water is in every caſe neceſſary. Hard water for this proceſs is peculiarly inadmiſſible, as the principle in waters, giving the property called *hardneſs*, is generally a ſalt of lime, which decompoſes the carbonate of magneſia, by compound affinity, giving riſe to carbonate of lime, while the magneſia unites itſelf to the acid of the calcareous ſalt, by which the quantity of the carbonate is not only leſſened, but is rendered impure by the admixture of carbonate of lime. Another ſource of impurity is the ſilica which the ſubcarbonate of potaſs generally contains. It is moſt eaſily got rid off by expoſing the alkaline ſolution to the air for ſeveral days before it is uſed. In proportion as it becomes ſaturated with carbonic acid, the ſilica is precipitated, and may be ſeparated by filtration.

The carbonate of magneſia thus prepared is a very light, white, opaque ſubſtance, without ſmell or taſte, effervefcing with acids. It is not, however, ſaturated with carbonic acid. By decompoſing ſulphate of magneſia by an alkaline carbonate, without the application of heat, carbonate of magneſia is gradually depoſited in tranſparent, brilliant, hexagonal cryſtals, terminated by an oblique hexagonal plane, and ſoluble in about 480 times its weight of water. The cryſtallized carbonate of magneſia conſiſts of 50 acid, 25 magneſia, and 25 water; the ſub-carbonate conſiſts of 48 acid, 40 magneſia, and 12 water; and the carbonate of commerce of 34 acid, 45 magneſia, and 21 water. It is decompoſed by all the acids, potaſs, ſoda, baryta, lime, and ſtrontia, the ſulphate, phoſphate, nitrate, and muriate of alumina, and the ſuper-phoſphate of lime.

Med. uſe.—Carbonate of magneſia is principally given to correct acidity of the ſtomach, and in theſe caſes to act as a purgative; for ſolutions of magneſia in all acids are bitter and purgative; while thoſe of the other earths are more or leſs auſtere and aſtringent. A large doſe of magneſia, if the ſtomach contain no acid to diſſolve it, neither purges nor produces any ſenſible effect: a moderate one, if an acid be lodged there, or if acid liquors be taken after it, procures ſeveral ſtools; whereas the common abſorbents, in the ſame circumſtances, inſtead of looſening, bind the belly. When the carbonate of magneſia meets with an acid in the ſtomach, there is extricated a conſiderable quantity of carbonic acid gas, which ſometimes cauſes uneaſy diſtention of the ſtomach, and the ſymptoms of flatulence. In ſuch caſes, therefore, magneſia is preferable to its carbonate; but on other occaſions good effects ariſe from the action of the gas evolved, as in nauſea and vomiting.

Off prep.—Magneſia, *Ed. Lond. Dub.*

ALUMINIS PURIFICATIO. *Lond.*

Purification of Alum.

Take of

Alum, one pound;
Chalk, one drachm;
Diſtilled water, one pint.

Boil them a little, ſtrain, and ſet the liquor aſide to cryſtallize.

This proceſs is ſcarcely neceſſary; for the alum of commerce is ſufficiently pure for every purpoſe; and we apprehend that the addition of the chalk is unchemical, as its only effect will be to decompoſe part of the alum, without contributing to the purity of the reſt.

SULPHAS ALUMINÆ EXSICCATUS; olim, ALUMEN USTUM. *Edin.*

Dried Sulphate of Alumina, formerly *Burnt Alum.*

Melt alum in an earthen or iron veſſel, and keep it over the fire until it ceaſe to boil.

ALUMEN USTUM. *Lond. Dub.*

Burnt Alum.

Take of

Alum, half a pound. (Any quantity. *Dub.*)

Burn it in an earthen veſſel as long as it boils.

Mr. CHAPTAL found that by exſiccation in red heat, alum of his own manufacture loſt 0.67; Roman alum 0.50; Engliſh alum 0.47, and Levant alum only 0.40. Theſe differences ariſe principally from different proportions of water of cryſtallization, but alſo form an exceſs of alumina, which the laſt contains.

According to Kirwan, cryſtallized alum conſiſts of 17.66 acid, 12. alumina, and 70.24 water, and alum deſiccated at 700° of 36.25 acid, and 63.75 baſis, by which it would appear that at that heat it loſes not only all its water, but alſo more than half its acid.

Dried alum is only applied externally as a gentle eſcharotic to fungous ulcers.

CHAP. V.

METALLINE PREPARATIONS.

ANTIMONY.

SULPHURETUM ANTIMONII PRÆPARATUM; olim, ANTIMONIUM PRÆPARATUM. *Edin.* ANTIMONIUM PRÆPARATUM. *Lond.*

Prepared Sulphuret of Antimony, formerly *Prepared Antimony.*

Sulphuret of antimony is prepared in the ſame way as carbonate of lime.

STIBIUM PRÆPARATUM. *Dub.*
Prepared Antimony.

It is reduced to powder, and the impalpable particles, which are to be kept for uſe, are procured in the manner directed for the preparation of crabs claws.

By reducing the ſulphuret of antimony to the ſtate of an impalpable powder, it is both rendered much more active than it would otherwiſe be, and it is prevented from irritating the ſtomach mechanically, of which there would be ſome danger from the ſharpneſs of its ſpiculæ. Even in this ſtate, however, it is not a very certain remedy. In general, it operates as a very mild ſudorific or cathartic; but ſometimes, if it meet with much acid in the ſtomach, it becomes more active, producing vomiting or hypercatharſis. Therefore, it ſeems prudent to evacuate the primæ viæ before it be exhibited, and to combine it with an abſorbent earth.

It is principally given in ſcrofula, glandular obſtructions, cutaneous diſeaſes and rheumatiſm. Its doſe is from 10 to 30 grains and upwards, and it is beſt exhibited in the form of a powder or bolus.

OXIDUM ANTIMONII CUM SULPHURE, PER NITRATEM POTASSÆ; olim, CROCUS ANTIMONII. *Edin.*
Oxide of Antimony, with Sulphur, by Nitrate of Potaſs, formerly *Crocus of Antimony.*

Take of
Sulphuret of antimony,
Nitrate of potaſs, equal weights.

After they are ſeparately powdered and well mixed, let them be injected into a red hot crucible; when the deflagration is over, the reddiſh matter is to be ſeparated from the whitiſh cruſt, and reduced to powder, which is to be edulcorated by repeated waſhings with hot water, till the water come off inſipid.

CROCUS ANTIMONII. *Lond.* STIBIUM NITRO-CALCINATUM. *Dub.*
Crocus of Antimony. Antimony Calcined by Nitre.

Take of
Antimony, powdered,
Nitre, powdered; of each one ponnd;
Sea ſalt, one ounce.

Mix, and inject them by degrees into a red-hot crucible, and melt them, having augmented the heat. Pour out the melted matter; and, when cold, ſeparate it from the ſcoriæ.

In this proceſs, the nitric acid of the nitre, and part of the ſulphuret, are mutually decompoſed: the ſulphur is acidified, and combines with the potaſs of the nitre, while the antimony is converted into protoxide, which combines with the undecompoſed portion of the ſulphuret, and forms a dark brown, opaque, vitrified maſs; ſo that after the ſcoriæ and other ſaline matters have been removed by waſhing, the ſubſtance which remains, according to Prouſt, conſiſts of three parts of oxide of antimony, and one of ſulphuret of antimony.

With regard to the mode of preparation, Bergmann obſerves, that by the common proceſs of throwing the mixture into an ignited uncovered crucible, there is ſometimes a loſs of nearly one half, and therefore adviſes the mixture to be put into a cold crucible, which is to be covered and heated till the matter melts, by which means there is very little loſs.

What is kept in the ſhops, is almoſt univerſally prepared with leſs nitre than is here ordered. The conſequence is, that too much ſulphur remains not acidified, the antimony is ſcarcely oxidized, and the preparation is unfit for the uſes to which it ought to be applied. When nitre has been thus culpably economized, the crocus has a ſteel grey, inſtead of a liver brown colour. The addition of common ſalt, directed by the London and Dublin colleges, is improper, as it is decompoſed, and a portion of muriate of antimony is formed.

The ſulphuretted oxide of antimony is a very uncertain preparation, often operating with very great violence. Its internal uſe is therefore almoſt proſcribed, or at leaſt confined to maniacal caſes, and veterinary practice. It is, however, uſeful in pharmacy, as the baſis of other preparations.

OXIDUM ANTIMONII, CUM SULPHURE, VITRIFICATUM; olim, VITRUM ANTIMONII. *Ed.*

Vitrified Oxide of Antimony with Sulphur, formerly *Glaſs of Antimony.*

Strew ſulphuret of antimony beat into a coarſe powder like ſand, upon a ſhallow unglazed earthen veſſel, and apply a gentle heat underneath, that the antimony may be heated ſlowly: keeping it at the ſame time continually ſtirring, to prevent it from running into lumps. White vapours of a ſulphureous ſmell will ariſe from it. When they ceaſe with the degree of heat firſt applied, increaſe the fire a little, ſo that vapours may again ariſe; go on in this manner, till the powder, when brought to a red heat, exhales no more vapours. Melt this powder in a crucible with an intenſe heat, till it aſſumes the appearance of melted glaſs; then pour it out on a heated braſs plate.

ANTIMONIUM VITRIFICATUM. *Lond.*

Vitrified Antimony.

Take of

Powdered antimony, four ounces.

Calcine it in a broad earthen veſſel with fire gradually raiſed, ſtirring it with an iron rod until it no longer emit ſmoke. Put this powder into a crucible, ſo as to fill two thirds of it. A cover being fitted on, make a fire under it, at firſt moderate, afterwards ſtronger, until the matter be melted. Pour out the melted glaſs.

GLASS of antimony, according to Prouſt, conſiſts of one part of ſulphuret of antimony, combined with eight of oxide of antimony; now, by this proceſs, the greateſt part of the antimony is deprived of its ſulphur, and is at the ſame time converted into the protoxide, which combines with the ſmall portion of ſulphuret which remains undecompoſed. But as this preparation is not eaſily made in the manner here directed, unleſs in a furnace conſtructed on purpoſe, apothecaries may advantageouſly adopt the ſynthetical method of Bergmann, which conſiſts in melting in a crucible, with one twelfth or eighth of its weight of ſulphur, protoxide of antimony prepared by deflagrating it with more than twice its weight of nitre. At the temperature neceſſary for melting it, the peroxide of antimony loſes great part of its oxygen, and is converted into ſulphuret and protoxide, in the proportions which form the glaſs of antimony. From our preſent knowledge of the compoſition of this ſubſtance it might be named oxidum antimonii cum ſulphureto.

In whichever way prepared, the glaſs of antimony is tranſparent, and has a fine hyacinthine colour. On diſſolving it in muriatic acid, it gives out ſulphuretted hydrogen gas. Its medical operation is ſo uncertain, that it is only uſed in making other preparations.

OXIDUM ANTIMONII VITRIFICATUM, CUM CERA; olim, VITRUM ANTIMONII CERATUM. *Ed.*

Vitrified Oxide of Antimony with Wax; formerly *Cerated Glaſs of Antimony.*

Take of

Yellow wax, one part;

Vitrified oxide of antimony, with ſulphur, eight parts.

Melt the wax in an iron veſſel, and throw into it the powdered oxide ; roaſt the mixture over a gentle fire for a quarter of an hour, continually ſtirring it ; then pour it out, and when cold grind it into powder.

The glaſs melts in the wax with a very gentle heat : after it has been about twenty minutes on the fire, it begins to change its colour, and in ten more comes near to that of Scottiſh ſnuff ; which is a mark of its being ſufficiently prepared ; the mixture loſes about one ninth of its weight in the proceſs.

This medicine was for ſome time much eſteemed in dyſenteries. The doſe is from two or three grains to twenty, according to the age and ſtrength of the patient. In its operation, it makes ſome perſons ſick, and vomit ; it purges almoſt every one ; though it has ſometimes effected a cure without occaſioning any evacuation or ſickneſs. It is now, however, much leſs uſed than formerly.

SULPHUR STIBIATUM FUSCUM ; olim, KERMES MINERALIS. *Dub.*

Brown Antimoniated Sulphur ; formerly *Kermes Mineral.*

Take of
Prepared antimony,
Mild vegetable alkali, each one ounce.

Melt them together in a crucible, and when cold reduce the ſubſtance to powder. Put this into a matraſs with five pounds of pure water, and boil for an hour. Then remove the veſſel from the fire ; let it ſtand at reſt for a little, and as ſoon as the liquor becomes clear, pour it cautiouſly from the ſediment. When the liquor grows cool, the brown antimoniated ſulphur will ſeparate, which is to be dried on paper.

According to Thenard, the brown precipitate conſiſts of

72.760	brown oxide of antimony.
20.298	ſulphuretted hydrogen.
4.156	ſulphur.
2.786	water and loſs.
100.	

He conſiders kermes mineral, therefore, as a ſulphuretted hydroguret of antimony, eſpecially as it differs from that which is prepared by the direct combination of its conſtituents, only in containing a ſmall quantity of ſuperabundant ſulphur.

When the ſulphuret of antimony and carbonate of potaſs are melted together, the carbonic acid is expelled with effervefcence; and a fulphuret of antimony and potafs is formed. On boiling this in water, water is decompofed, the antimony is oxidized, and the hydrogen combines with the fulphur. The fulphuretted hydrogen thus formed, combines partly with the potafs, and partly with the oxide of antimony. Now, the fulphuretted hydroguret of antimony, (kermes mineral), is foluble in a folution of fulphuretted hydroguret of potafs, at 212°, but not at ordinary temperatures. Therefore, on cooling, it feparates and falls to the bottom.

Such is the prefent theory of the formation of kermes mineral. With regard to the practice, the directions of the Dublin college differ confiderably, efpecially in the proportions of the fubftances employed, from the beft pharmaceutical writers on the Continent. Lemery melted fixteen parts of fulphuret of antimony, and one of fulphur, with eight parts of carbonate of potafs. The laft edition of the Pruffian pharmacopœia directs two parts of fulphuret of antimony, and one of exficcated carbonate of foda, to be melted, and afterwards boiled fifteen minutes in fix or eight parts of water, which on cooling depofites a confiderable quantity of kermes. The fluid from which the kermes has been depofited may be again boiled in the refiduum of the firft decoction, and it will diffolve a frefh portion of kermes; and this procefs may be repeated as long as there remains any to diffolve. After this, the refiduum, when melted, confifts almoft folely of antimony. It therefore appears, that the alkali renders almoft all the fulphur foluble, and only difpofes the oxidizement of as much antimony as is capable of combining with the fulphuretted hydrogen. There appears to be no reafon why the whole of the antimony fhould not be converted into kermes by employing a proper addition of fulphur and alkali.

Kermes is alfo made in the humid way. Fourcroy boils, in twenty parts of water, fix parts of pure potafs of commerce, and into the boiling folution throws about the twentieth part of the weight of the alkali, or 0.3 of a part of powdered fulphuret of antimony, and continues the boiling for feven or eight minutes, then filters, and allows the kermes to precipitate by cooling. Hermbftadt ufes very different proportions; for he boils twelve parts of fulphuret of antimony, and three of falt of tartar, in ninety-fix parts of water, down to fixty-four, and then filters, &c. Gren employs four parts of fulphuret of antimony, fixteen of carbonate of potafs, and fixty-four of war, and boils for feveral hours. Götling boils eight parts of fulphuret of antimony, and two of fulphur in a fufficient quantity of folution of potafs down to one half.

Med. ufe.—This preparation of antimony is lefs ufed in Britain than on the Continent. It is an active fubftance, and apt to excite vomiting. To adults, the dofe is a grain, or a grain and a half.

SULPHURETUM ANTIMONII PRÆCIPITATUM. *Edin.*

SULPHUR ANT. PRÆCIP. *Lond.* SULPHUR STIBIATUM RUFUM. *Dub.*

Precipitated Sulphuret of Antimony. Precipitated Sulphur of Antimony. Orange Antimoniated Sulphur.

Take of
Water of potaſs, four pounds;
Water, three pounds;
Prepared ſulphuret of antimony, two pounds.

Boil them, in a covered iron pot, over a ſlow fire for three hours, adding more water, if neceſſary, and frequently ſtirring the mixture with an iron ſpatula: ſtrain the liquor while warm through a double cloth, and add to it when filtered as much diluted ſulphuric acid as is neceſſary to precipitate the ſulphuret, which muſt be well waſhed with warm water.

THIS is alſo, according to the analyſis of Thenard, a ſulphuretted hydroguret of antimony, which conſiſts of

68.3	orange oxide of antimony,
17.877	ſulphuretted hydrogen,
12.	ſulphur,
98.177	

Thenard conſiders the ſulphur as only mechanically and accidentally mixed; and that the eſſential difference between this preparation and kermes mineral conſiſts in the degree of oxidizement of the antimony.

But notwithſtanding the great celebrity of Thenard as a chemiſt, and his having paid particular attention to the combinations of antimony, we may be allowed to doubt the accuracy of his opinion, for it muſt appear to every one an affected refinement of analyſis, to diſcover in ſuch ſubſtances a difference of only 2 *per cent* of oxidizement; and as Prouſt has ſince ſhewn that both preparations contain the protoxide, the only difference between theſe bodies appears to be the proportion of ſulphur they contain. For it is agreeable to analogy to ſuppoſe, that the ſulphuretted hydroguret of antimony is more ſoluble in a ſolution of hydroguretted ſulphuret of potaſs at 212°, than at 60°. Therefore, as a boiling ſolution cools, that portion of the ſulphuretted hydroguret of antimony, which it is unable to retain in ſolution at a reduced temperature, ſeparates and forms the red precipitate, known by the name of Kermes Mineral; but the portion which remains in ſolution, can only be obtained by decompoſing the hydroguretted ſulphuret of potaſs itſelf, by means of an acid; and therefore the precipitate forming the ſulphur auratum antimonii, is a mixture or compound of hydroguretted ſulphuret of antimony, (kermes mineral) with the ſulphur of the decompoſed ſulphuret of potaſs, which gives it a brighter and paler colour.

The precipitated ſulphuret of antimony, like the kermes, may be prepared either in the dry or in the moiſt way. The latter is the mode adapted by the Britiſh colleges, and alſo ſeems to be the moſt univerſally employed on the Continent. Göttling boils two parts of ſulphuret of antimony, and three of ſulphur, in a ſufficient quantity of a recent ſolution of potaſs, filters the ſolution, and precipitates with ſulphuric acid, diluted with twelve times its weight of water. Wiegleb treats in the ſame manner two parts of ſulphuret of antimony with one of ſulphur. But to his proportions it has been objected, that the product reſembles kermes more than ſulphur auratum. If this objection be juſt, it muſt apply in a ſtill ſtronger degree to the formula of the Britiſh colleges, it which no ſulphur is added.

In the dry way, two parts of ſulphuret of antimony and three of ſulphur may be melted with five or ſix of pure carbonate of potaſs in a covered crucible, as quickly as poſſible, poured into an iron mortar, reduced to powder, and diſſolved by boiling the powder in water. The ſolution is to be filtered warm, diluted with a ſufficient quantity of water, and precipitated with dilute ſulphuric acid. By ſome, the ſolution is allowed to remain at reſt for twenty-four hours before it be filtered, and ſome precipitate with nitrous acid.

The proceſſes for making the golden ſulphuret of antimony, depend on the property which the hydroguretted ſulphuret of potaſs poſſeſſes, of diſſolving, and retaining diſſolved, even at ordinary temperatures, a portion of orange oxide of antimony; and as the attraction by which potaſs exiſts in this compound is weaker than its affinity for acids, on the addition of any acid, the potaſs unites with the acid; a portion of ſulphuretted hydrogen gas eſcapes; and the oxide of antimony, combined with the reſt of the ſulphur and hydrogen, are precipitated in the form of a light orange powder. When the acid is added gradually, the proportion of oxide of antimony always decreaſes, while that of the ſulphur increaſes in each ſucceſſive portion of precipitate. Hence in the old manner of preparing this ſubſtance from the ſcoriæ, formed in reducing antimony from its ſulphuret, and which contained but little ſulphur, the two firſt portions of precipitate, being dark coloured, were rejected, and only the product of the third precipitation retained for uſe. The want of economy in this proceſs is ſufficiently obvious, as well as the very great improvement in modern times, of adding a ſufficient quantity of ſulphur, and precipitating the whole at once.

Med. Uſe.—In its action on the body, the orange ſulphuret of antimony coincides with the kermes mineral; but on account of the larger proportion of ſulphur, it muſt be given in ſomewhat larger doſes.

Off. prep.—Pulv. ſtibii comp. *Dub.*

MURIAS ANTIMONII. *Edin.* ANTIM. MURIATUM. *Lond.* STIBIUM MURIATUM CAUSTICUM. *Dub.*

Muriate of Antimony. Muriated Antimony. Cauſtic muriated Antimony.

Take of
Oxide of antimony with ſulphur, by nitrate of potaſs,
Sulphuric acid, each one pound;
Dried muriate of ſoda two pounds.

Pour the ſulphuric acid into a retort, gradually adding the muriate of ſoda and oxide of antimony previouſly mixed. Then perform the diſtillation in a ſand-bath. Expoſe the diſtilled matter for ſeveral days to the air, that it may deliqueſce, and then pour the liquid part from the feces.

MURIATE of antimony was originally prepared by diſtilling ſulphuret of antimony with muriate of quickſilver. Muriate of antimony, or butter of antimony, as it was called from its appearance when recently prepared, paſſes over into the receiver, and black ſulphuret of quickſilver remains in the retort, or, by increaſing the heat, red ſulphuret of mercury, which, when obtained by this proceſs, was formerly termed Cinnabar of antimony, is ſublimed. But this mode of preparation is both expenſive and dangerous to the health of the operator. To avoid theſe inconveniences, Scheele prepared a ſulphuretted oxide of antimony, by deflagrating two parts of ſulphuret of antimony with three of nitrate of potaſs in an iron mortar. The maſs thus obtained is to be powdered, and one pound of it put into a glaſs veſſel, on which is to be poured, firſt a mixture of three pounds of water and fifteen ounces of ſulphuric acid, and afterwards fifteen ounces of powdered common ſalt. The whole is to be digeſted for twelve hours, and ſtirred all the while, and the ſolution, when cool, ſtrained through linen. On the reſiduum one third of the above menſtruum is to be poured, and the mixture digeſted and ſtrained. When diluted with boiling water, a copious precipitate of ſubmuriate of antimony takes place from the decompoſition of the muriate, while the other ſalts contained in the ſolution are not affected by it. Mr. Stott ſays, that the digeſtion need not be continued longer than two or three hours, and that the heat muſt be kept moderate, as the muriate of antimony begins to evaporate before it boils. This proceſs furniſhes an eaſy, if not the beſt, mode of preparing the ſubmuriate of antimony, but it does not give us the ſolution of the muriate in a ſtate of purity. But in conſequence of its volatility, we may eaſily ſeparate it from the other ſalts by diſtillation. This was firſt propoſed by Gmelin, and improved by Wiegleb, who diſtilled a mixture of one part of ſulphuret of antimony, four of muriate of ſoda, and three of ſulphuric acid diluted with two of water; but in this proceſs, the product is rendered impure by the admixture of ſulphur, and there is great danger of the veſſels burſting from the immenſe quantity of ſulphuretted hydrogen gas diſengaged. In 1781, the proceſs adopted by the Britiſh colleges was firſt introduced in the London Pharmacopœia. But we have already obſerved, that the oxide of antimony made uſe of in this preparation, is ſeldom ſufficiently oxidized or deprived of its ſulphur, which occaſions the production of much ſulphuretted hydrogen gas, and from the concentrated ſtate in which the materials are employed, the muriatic acid gas is ſometimes diſengaged, eſpecially if the heat be improperly applied, ſo rapidly, that it has not time to act upon the oxide of antimony. At laſt, in 1797, Göttling, by ſubſtituting the glaſs of antimony for the crocus, diluting the ſulphuric acid, and uſing the muriate of ſoda cryſtallized, removed theſe inconveniences. He introduces into a retort a mixture of four ounces of glaſs of antimony in powder, with ſixteen of muriate of ſoda, and then pours into it twelve ounces of ſulphuric acid, diluted with eight of water. He lutes on a tubulated receiver with gypſum, and diſtils to dryneſs in a ſand-bath, with a heat gradually increaſed. By this proceſs, he ſays, about twenty ounces of very ſtrong fuming ſolution of muriate of antimony are obtained. The reſiduum in the retort is ſulphate of ſoda, but unfit for internal uſe, on account of its being mixed with ſome antimony.

Butter of antimony is cryſtallizable. It is remarkably deliqueſcent, and forms a permanent ſolution; but if more than a certain proportion of water be added, it is decompoſed; a large quantity of ſubmuriate of antimony being precipitated, in the form of white ſilky cryſtals, while a ſuper-muriate remains in ſolution. Butter of antimony has been ſaid by Dr. Thomſon to contain the peroxide, but beſides the well known ſolubility of the oxide and ſub-muriate prepared from it, in tartaric acid, an additional proof that it contains the protoxide, occurred to myſelf in the rapid effervEſcence of hydrogen gas which takes place when zinc is immerſed in it.

CALX STIBI PRÆCIPITATA. *Dub.*

Precipitated Calx of Antimony.

Take of

Mild vegetable alkali, 1

Cauſtic muriated antimony, each eight ounces;
Water, forty pounds.

Diſſolve the vegetable alkali in the water, and to the filtered liquor add the cauſtic muriated antimony. Dry the calx which ſubſides, after waſhing away the ſaline matters.

This proceſs is intended to ſeparate the protoxide contained in the muriate of antimony, by means of the ſuperior affinity which potaſs poſſeſſes for muriatic acid. It is abſolutely neceſſary that the muriate of antimony be poured into the alkaline ſolution, and not the ſolution into the muriate; for the muriate is partially decompoſed by water alone, which combines with part of the acid; and the ſalt, brought to the ſtate of an inſoluble ſubmuriate, is precipitated. Therefore, if we pour the alkaline ſolution into the muriate of antimony, the muriate acts firſt upon the alkali, and immediately afterwards upon the water of each portion of the ſolution; and therefore we obtain a mixed precipitate of oxide of antimony and ſubmuriate of antimony. But if we pour the muriate into the alkaline ſolution, the whole acid of each portion of the muriate immediately finds a ſufficient quantity of alkali to ſaturate it, and the whole, or at leaſt a much larger proportion of the antimony, is precipitated in the ſtate of oxide.

OXIDUM ANTIMONII cum PHOSPHATE CALCIS; olim, Pulvis Antimonialis. *Ed.* Pulvis Antimonialis. *Lond.* Pulvis Stibiatus. *Dub.*

Oxide of Antimony with Phoſphate of Lime, Antimonial Powder.

Take of
Sulphuret of antimony, in coarſe powder,
Shavings of hartſhorn, equal weights.

Mix, and put them into a wide red-hot iron pot, and ſtir the mixture conſtantly, until it be burnt into a matter of a grey colour, which is then to be removed from the fire, ground into powder, and put into a coated crucible. Lute to this crucible another inverted over it, and perforated in the bottom with a ſmall hole, and apply the fire, which is to be raiſed gradually, to a white heat, and kept in that increaſed ſtate for two hours. Laſtly, grind the matter, when cold, into a very fine powder.

This is ſuppoſed to be nearly the ſame with the celebrated noſtrum of Dr. James, the compoſition of which was aſcertained by Dr. Pearſon of London, to whom we are alſo indebted for the above formula.

By burning ſulphuret of antimony and ſhavings of hartſhorn in a white heat, the ſulphur is entirely expelled, and the antimony is oxidized, while the gelatine of the hartſhorn is deſtroyed, and nothing is left but phoſphate of lime, combined with a little lime. Therefore, the maſs which reſults is a mixture of oxide of antimony and phoſphate of lime, which correſponds, at leaſt as to the nature of the ingredients, with James's powder, which, by Dr. Pearſon's analyſis, was found to conſiſt of 43 phoſphate of lime, and 57 oxide of antimony. Another excellent chemiſt, Mr. Chenevix, has lately propoſed a method of forming the ſame combination in the humid way, with the view of obtaining a preparation always ſimilar in its compoſition and properties. He has led to this propoſal by conſidering the uncertainty of the application, and the precarious nature of the agency of fire, by which means a variable portion of the oxide of antimony may be volatilized, and that which remains may be oxidized in various degrees.

Mr. Chenevix therefore propoſes to prepare a ſubſtitute for James's powder, by diſſolving together equal weights of ſubmuriate of antimony and of phoſphate of lime in the ſmalleſt poſſible quantity of muriatic acid, and then pouring this ſolution gradually into water ſufficiently alkalized with ammonia. For the reaſon mentioned in the preceding article, it is abſolutely neceſſary that the muriatic ſolution be poured into the alkaline liquor. By an oppoſite mode of procedure, the precipitate would contain more antimony at firſt, and towards the end the phoſphate of lime would be predominant, and the antimony would be partly in the ſtate of a ſubmuriate. The phoſphate of lime is moſt conveniently obtained pure by diſſolving calcined bone in muriatic acid, and by precipitating it by ammonia. If the ammonia be quite free from carbonic acid, no muriate of lime is decompoſed. Mr. Chenevix alſo found, that his precipitate is entirely ſoluble in every acid which can diſſolve either phoſphate of lime or oxide of antimony ſeparately, and that about 0.28 of James's powder, and at an average 0.44 of the pulvis antimonialis of the London Pharmacopœia reſiſt the action of every acid.

Medical uſe.—The oxide of antimony with phoſphate of lime, howſoever prepared, is one of the beſt animonials we poſſeſs. It is given as a diaphoretic in febrile diſeaſes, in doſes of from three to eight grains, repeated every third or fourth hour. In larger quantities, it operates as a purgative or emetic. From its being inſoluble in water, it muſt be given either in the form of a powder, or made into a pill or bolus.

TARTRIS ANTIMONII; olim, TARTARUS EMETICUS. *Edin.*
ANTIMONIUM TARTARISATUM. *Lond.*
Tartrite of Antimony, formerly *Tartar Emetic.* *Tartarized Antimony.*

Take of

Oxide of antimony with ſulphur, by nitrate of potaſs, three parts;

Super-tartrite of potaſs, four parts;
Diſtilled water, thirty-two parts,

Boil in a glaſs-veſſel for a quarter of an hour, ſtrain through paper, and ſet aſide the ſtrained liquor to cryſtallize.

TARTARUM STIBIATUM. *Dub.*

Antimoniated Tartar.

Take of
The precipitated calx of antimony, two ounces;
Cryſtals of tartar in very minute powder, four ounces;
Diſtilled water, five pounds.

Boil until the powders be diſſolved, and ſtrain the liquor when cold through paper; then having thrown away the ſalt which remains upon the paper, cryſtallize by evaporation and ſlow refrigeration. The cryſtals ſhould have a regular figure.

THE tartaric acid is capable of combining, in many examples, with two baſes at the ſame time, forming with them triple cryſtallizable ſalts. In the preſent inſtance, it is combined with oxide of antimony and potaſs; aud as the potaſs is eſſential to its conſtitution, and the real tartrate of antimony is a different ſalt, its name ſhould certainly have been Tartrate of Antimony and Potaſs.

In the preparation of this ſalt, the different combinations of protoxide of antimony have been employed. Any of them will afford a very pure ſalt. The crocus, precipitated oxide, ſubmuriate, and glaſs, are all occaſionally employed. The London and Edinburgh colleges uſe the crocus. To this the principal objection is, that it is never found in the ſhops in a ſtate fit for this purpoſe. The Dublin college uſe the precipitated oxide, which anſwers extremely well, but is too expenſive to be generally adopted. The ſubmuriate, which is more eaſily prepared, is juſt as good; for the muriatic acid is completely ſeparated by part of the potaſs, and remains in the mother water. Mr. Stott thinks muriatic acid eſſential to the conſtitution of good tartar emetic, and ſays, that he never could obtain it in tranſparent cryſtals, when he employed the glaſs or crocus, or any other oxide of antimony, than the pulvis algerothi. He therefore concludes, that tartar emetic is a quadruple ſalt, conſiſting of oxide of antimony, with muriatic acid, rendered ſoluble by acid of tartar, combined with an undue proportion of potaſs, and takes the opportunity of remarking, that he has not found a name in the new nomenclature expreſſive of its conſtituent parts. Such an aſſertion is eaſily made; but I can only ſay, that I have repeatedly prepared tartar emetic perfectly colourleſs, and in very large and beautiful cryſtals, both with the crocus and glaſs, and that therefore muriatic acid, if ever preſent, muſt always be conſidered as an impurity. The glaſs is perhaps the leaſt objectionable of any, and is recommended by Göttling. It always, however, contains about 0.1 of ſilica. The quantity of water employed muſt be ſufficient to diſſolve the tartar-emetic formed. The time during which the ebullition is to be continued, is ſtated differently by different pharmaceutiſts. No harm can ariſe from continuing it longer than is abſolutely neceſſary; but it is certainly a waſte of time and fuel to protract it for hours. But the circumſtance which renders the tartar-emetic moſt variable in its effects, is the mode of cryſtallization. Some evaporate it to dryneſs; others to a pellicle, and ſet it aſide to cryſtallize; and others again cryſtallize by ſlow evaporation. On account of the ſilica which is combined with the oxide of antimony, and which, being held in ſolution by the potaſs, impedes the cryſtallization, and varies the nature of the product, Vauquelin recommends the ſolution to be firſt evaporated to dryneſs, and that the ſaline maſs obtained ſhould be rediſſolved in boiling water, and then cryſtallized: for, towards the end of the firſt evaporation, the ſilica ſeparates, and becomes totally inſoluble. In this way, he ſays, that we obtain both a purer ſalt, and in larger quantity. If we employ an exceſs of ſupertartrate of potaſs, part of it will remain undecompoſed, and will cryſtallize before or along with the tartar-emetic. This ſource of impurity is eaſily avoided by uſing an exceſs of the antimonial oxide, which remaining undiſſolved, occaſions no error, and prevents the neceſſity of throwing away, as the Dublin college direct, the cryſtals which form on the filtering paper, if the ſolution be ſaturated.

The primitive form of the cryſtals of tartrate of antimony and potaſs ſeems to be the regular tetrahedron, but it aſſumes a variety of ſecondary forms. It has a ſtyptic metallic taſte. It is ſoluble in three times its weight of water at 212°, and in fifteen at 60°. As this ſtatement of its ſolubility is very different from that of moſt writers, from Bergmann to Fourcroy, who ſay that it requires 80 parts of water at 60°, and ſometimes leſs than 40 of boiling water, it is neceſſary to mention, that it was aſcertained by careful experiment, with very fine cryſtals of tartar-emetic, more than half an inch in length, and perfectly free from the admixture of any foreign ſalt. The cryſtals, by expoſure to the air, become white and opaque, but do not readily fall to powder. The property of deliqueſcing aſcribed to them by Göttling, muſt have ariſen from the preſence of other ſalts, as he does not prepare his tartar-emetic by cryſtallization, but by evaporating the ſolution to dryneſs. The ſolution of tartar-emetic ſlightly reddens tincture of turnſol. It is decompoſed by acids, alkalies, alkaline carbonates, ſulphuretted hydrogen and its compounds, vegetable juices, decoctions and infuſions, and many of the metals. According to Thenard, it conſiſts of tartrate of antimony 54, tartrate of potaſs 34, water 8, and loſs 4; or, oxide of antimony 38, tartaric acid 34, potaſs 16, water and loſs 12; and by eſtimation from the analyſis of tartrate of potaſs, and ſuper-tartrate of potaſs, by the ſame chemiſt, it appears, that to ſaturate 38 parts of protoxide of antimony, 70.4 of ſuper-tartrate of potaſs are neceſſary: the whole of the ſuperfluous acid, being 16, combines with the oxide, while 34 of the tartrate of potaſs combine with the tartrate of antimony thus formed, and 20.4 of tartrate of potaſs remain in ſolution in the mother water.

We have been thus particular in our account of the preparation and chemical properties of tartar-emetic, becauſe it is not only of all the preparations of antimony the moſt certain in its operation, but is almoſt indiſpenſable for the ſucceſsful practice of medicine.

Medical uſe.—In doſes of from one to three grains it operates as an emetic, and ſometimes as a carthartic. In ſmaller doſes, it excites nauſea, and proves a powerful diaphoretic and expectorant. As an emetic it is chiefly given in the beginning of fevers and febrile diſeaſes, in chincough, and, in general, whenever we wiſh to evacuate the ſtomach quickly. When great debility is preſent, and in the advanced ſtages of typhoid fever, its uſe is improper, and even ſometimes fatal. As a diaphoretic it is given in ſmall doſes, of from an eighth to a quarter of a grain; and as an expectorant in doſes ſtill ſmaller.

The only proper form for exhibiting it is in ſolution; and as the intenſity of its action on the body is liable to variation, from differences in its own ſtrength, and in the conſtitution of the patient, it ſhould almoſt always be given in divided doſes, at ſhort intervals, if we wiſh to excite vomiting; and at longer intervals, if we only wiſh it to act on the ſkin or lungs.

VINUM TARTRITIS ANTIMONII; olim, VINUM ANTIMONIALE. *Ed.*

Wine of Tartrate of Antimony, formerly *Antimonial Wine.*

Take of
Tartrite of antimony, twenty-four grains;
Spaniſh white wine, one pound.
Mix them ſo that the tartrite of antimony may be diſſolved.

VINUM TARTARI STIBIATI. *Dub.* VINUM ANT. TARTAR. *Lond.*

Wine of Antimoniated Tartar. Wine of Tartarized Antimony.

Take of
Antimoniated tartar, ten grains; *Dub.* Two ſcruples; *Lond.*

Diſtilled water, boiling hot, half an ounce; *Dub.* Two ounces; *Lond.*
Spaniſh white wine, two ounces; *Dub.* Eight ounces: *Lond.*
Diſſolve the antimoniated tartar in the water, and then add the wine.

VINUM ANTIMONII. *Lond.*

Wine of Antimony.

Take of
Vitrified antimony, in powder, one ounce;
Spaniſh white wine, a pint and a half.
Digeſt them for twelve days, agitating them frequently, and ſtrain through paper.

All theſe are ſolutions of tartrate of antimony and potaſs in wine; for, in the laſt inſtance, a portion of the glaſs of antimony is diſſolved by the ſuper-tartrate of potaſs contained in the wine; and as the quantity of this is variable, ſo alſo the quantity of oxide of antimony diſſolved, varies: and therefore the preparation ought to be entirely rejected, ſince its ſtrength can never be known. It is alſo to be regretted, that the ſtrength of the ſolutions of tartar-emetic in wine, as preſcribed by the different colleges, is not uniform. According to the Edinburgh college, one ounce of the ſolution contains two grains of tartar-emetic, while the ſame quantity, according to the other colleges, contains four grains.

In its employment and effects, the vinous ſolution of tartar-emetic does not differ from one made with water.

ANTIMONIUM CALCINATUM. *Lond.*

Calcined Antimony.

Take of
Antimony, powdered, eight ounces;
Nitre, powdered, two pounds.
Mix them, and project the mixture by degrees into a red hot crucible. Burn the white matter about half an hour; and, when cold, powder it; after which waſh it with diſtilled water.

On touching the ignited crucible, this mixture deflagrates with a lively white flame; the antimony is oxidized to the maximum, the ſulphur is acidified, and the nitre is decompoſed and reduced to its baſe. The product of this deflagration is a lemon-coloured, ſcorified maſs, which, after being waſhed with water, leaves the greater part of the oxide of antimony united to about a fifth of its weight of potaſs; while the remainder of the oxide, combined with a much larger proportion of potaſs, is diſſolved in the water, along with the ſulphate of potaſs formed, and a ſmall quantity of nitre which has eſcaped decompoſition, The peroxide of antimony obtained by this proceſs contains about 0.30 oxygen, is ſcarcely acted upon by acids, and is capable of forming, with the alkalies, cryſtallizable compounds, enjoying a determinate degree of ſolubility. It may therefore be conſidered as nearly approaching to the ſtate of an acid; and the inſoluble reſiduum of this proceſs might be named ſuper-antimonite of potaſs, and the diſſolved portion, from its different proportions, antimonite of potaſs.

This is a preparation of no very great activity. It formerly bore the name of Diaphoretic antimony, from its ſuppoſed effect; but even that was doubted: and ſince the introduction of James's powder into general uſe, it has not been much employed. It may be given in doſes of from five grains to half a drachm.

CHAP VI.

SILVER.

NITRAS ARGENTI; olim, CAUSTICUM LUNARE. *Ed.* ARGENTUM NITRATUM. *Dub.*

Nitrate of Silver. *Nitrated Silver,* formerly *Lunar Cauſtic.*

Take of
Pureſt ſilver, flatted into plates, and cut in pieces, four ounces;
Diluted nitrous acid, eight ounces;
Diſtilled water, four ounces.

Diſſolve the ſilver in a phial with a gentle heat, and evaporate the ſolution to dryneſs. Then put the maſs into a large crucible, and place it on the fire, which ſhould at firſt be gentle, and afterward increaſed by degrees till the maſs flows like oil; then pour it into iron-pipes, previouſly heated and anointed with tallow. Laſtly, keep it in a glaſs-veſſel well ſhut.

ARGENTUM NITRATUM. *Lond.*

Nitrated Silver.

Take of
Silver, one ounce;
Diluted nitrous acid, four ounces.

Diſſolve the ſilver in the diluted nitrous acid, in a glaſs veſſel, over warm ſand; then dry it by gently increaſing the heat; afterwards melt it in a crucible, taking care that the heat be not too great, and pour it into proper forms.

The only difference between theſe formulæ is in the proportion of acid employed. The Edinburgh and Dublin colleges uſe equal weights of ſilver and acid. The London college uſes double the quantity of acid. The fact is, that nitrous acid is capable of diſſolving more than half its weight of ſilver. Therefore, in the one caſe, a portion of ſilver will be left undiſſolved; and, in the other, there will be an exceſs of acid, which, however, will be expelled by the heat neceſſary to bring the ſalt to a ſtate of dryneſs. During the ſolution the metal is oxidized by the decompoſition of part of the acid, while the nitrous gas diſengaged at firſt diſſolves in the acid, and gives it a green colour, which, however, diſappears when the heat is increaſed ſo as to expel the gas. The acid employed muſt be very pure. If it contain, as the acid of commerce always does, ſulphuric or muriatic acid, theſe re-act upon the nitrate as ſoon as it is formed, and a white precipitate, conſiſting of ſulphate and muriate of ſilver, falls to the bottom.

The method which the refiners employ for examining the purity of their aquafortis (the name they give to dilute nitrous acid), and purifying it if neceſſary, is to let fall into it a few drops of a ſolution of nitrate of ſilver already made: if the liquor remain clear, and grow not in the leaſt turbid or whitiſh, it is fit for uſe; otherwiſe, they add a ſmall quantity more of the ſolution, which immediately turns the whole of a milky white colour; the mixture being then ſuffered to reſt for ſome time, depoſites a white ſediment; from which it is cautiouſly decanted, examined again, and, if neceſſary, farther purified by a freſh addition of this ſolution.

It is neceſſary to employ very pure water in this proceſs, for the muriates and earthy ſalts which common water generally contain, precipitate part of the ſilver in the ſtate of a muriate or oxide. If diſtilled water be not uſed, the water ſhould be added to the acid before it be tried and purified by the nitrate of ſilver.

The ſolution will go on the more ſpeedily, if the ſilver, flatted into thin plates, be rolled looſely up, ſo that the ſeveral ſurfaces do not touch each other. By this management, a greater extent of the ſurface is expoſed to the action of the menſtruum, than when the plates are cut in pieces and laid above each other. If the ſilver be alloyed with copper, the ſolution will have a permanent greeniſh blue colour, and acquire a bright blue on the addition of ammonia. If it contain gold, the gold is not diſſolved, but is found at the bottom of the ſolution, in the form of a black or deep purple powder.

The crucible ought to be of ſilver or porcelain; as, with the common crucibles, the loſs ariſing from the nitrate of ſilver ſinking into their ſubſtance is too great. It ought alſo to be large enough to hold five or ſix times the quantity of the dry matter; for it bubbles and ſwells up greatly, ſo as otherwiſe to be apt to run over. During this time, alſo, little drops are now and then ſpirted up, whoſe cauſticity is increaſed by their heat, againſt which the operator ought therefore to be on his guard. The fire muſt be kept moderate till this ebullition ceaſes, and till the matter becomes conſiſtent in the heat that made it boil before: then quickly increaſe the fire till the matter flows thin at the bottom like oil, on which it is to be immediately poured into the mould; for if the heat be continued after this, the nitrate of ſilver begins to be decompoſed, and the ſilver is reduced.

In want of a proper iron mould, one may be formed of tempered tobacco pipe clay, not too moiſt, by making, in a lump of it, with a ſmooth ſtick firſt greaſed, as many holes as there is occaſion for: pour the liquid matter into theſe cavities, and when congealed take it out by breaking the mould. Each piece is to be wiped clean from the greaſe, and wrapt up in ſoft dry paper, not only to keep the air from acting upon them, but likewiſe to prevent their corroding or diſcolouring the fingers in handling.

Nitrate of ſilver is cryſtallizable. Its cryſtals are brilliant plates, having a variable number of ſides. Their taſte is auſtere, and intenſely bitter. They are very ſoluble in water, but permanent in the air, and not deliqueſcent. They are decompoſed by heat, light, phoſphorus, charcoal, many metals, all the alkalies and earths, ſulphuric, muriatic, phoſphoric and fluoric acids, and by the ſalts they form. When deprived of water, and melted according to the directions of the colleges, it forms a black or dark grey coloured maſs, which, when broken, appears to conſiſt of radii, diverging from the centre. It is not deliqueſcent when free from copper, which is ſeldom the caſe. It may, however, be prepared perfectly pure, even from a ſolution containing copper, by evaporating and cryſtallizing it as long as it furniſhes firm tabular cryſtals. Theſe are then to be waſhed with a little diſtilled water, and melted with a gentle heat. The nitrate of copper remains in the mother water, and the ſilver, which it contains, may be precipitated with muriatic acid.

Medical uſe.—A ſtrong ſolution of nitrate of ſilver corrodes and decompoſes animal ſubſtances; in a more diluted ſtate it ſtains them of an indelible black; and for this purpoſe it is now much uſed as an indelible marking ink. The fuſed nitrate of ſilver is the ſtrongeſt and moſt manageable cauſtic we poſſeſs, and is employed to remove fungous excreſcences, callous edges, warts, ſtrictures in the urethra, and the like. It is alſo uſed to deſtroy the venereal poiſon in chancres, before it has acted on the ſyſtem. A weak ſolution of it may be applied as a ſtimulus to indolent ulcers, or injected into fiſtulous ſores.

Notwithſtanding its cauſticity, it has been given internally. Boerhaave, Boyle, and others, commend it highly in hydropic caſes. The former aſſures us, that made into pills with crumb of bread and a little ſugar, and taken on an empty ſtomach (ſome warm water ſweetened with honey being drank immediately after), it purges gently without griping, and brings away a large quantity of water, almoſt without the patient's perceiving it: that it kills worms, and cures many inveterate ulcerous diſorders. He nevertheleſs cautions againſt uſing it too freely, or in too large a doſe; and obſerves, that it always proves corroſive and weakening to the ſtomach.

It has been more recently employed, and with ſucceſs, in epilepſy and angina pectoris. On account of its very great activity, each pill ſhould not contain above one-eighth or one-fourth of a grain.

CHAP. VII.

COPPER.

ÆRUGO PRÆPARATA. *Dub.*

Prepared Verdegris.

Let the verdegris be ground to powder, and the minute particles be ſeparated in the manner directed for the preparation of crabs claws.

Lond.

Verdegris is to be prepared as other ſubſtances not ſoluble in water.

The intention of this proceſs is merely to obtain the ſub-acetate of copper in the ſtate of the moſt minute mechanical diviſion.

Off. prep.—Liquor cupri ammoniati, *Lond. Dub.*

SOLUTIO SULPHATIS CUPRI COMPOSITA; olim, AQUA STYPTICA. *Ed.*

Compound Solution of Sulphate of Copper, formerly *Styptic Water.*

Take of
Sulphate of copper,
Sulphate of alumina, each three ounces;
Water, two pounds;
Diluted ſulphuric acid, an ounce and a half.

Boil the ſulphates in the water to diſſolve them, and then add the acid to the liquor filtered through paper.

In this preparation, the ſubſtances diſſolved in the water exert no chemical action on each other, and the compoſition was probably contrived from the falſe idea, that the ſum of the powers of ſubſtances having ſimilar virtues, was increaſed by mixing them with each other.

Med. uſe.—It is chiefly uſed as a ſtyptic for ſtopping bleedings at the noſe; and for this purpoſe, cloths or doſſils, ſteeped in the liquor, are to be applied to the part.

AMMONIARETUM CUPRI; olim, CUPRUM AMMONIACUM. *Edin.*

Ammoniaret of Copper, formerly *Ammoniacal Copper.*

Take of
Pureſt ſulphate of copper, two parts;
Carbonate of ammonia, three parts.

Rub them carefully together in a glaſs mortar, until, after the efferveſcence has entirely ceaſed, they unite into a violet-coloured maſs, which muſt be wrapped up in blotting paper, and firſt dried on a chalk ſtone, and afterwards by a gentle heat. The product muſt be kept in a glaſs phial well cloſed.

CUPRUM AMMONIATUM. *Dub.*

Ammoniated Copper.

Take of
Vitriolated copper, half an ounce;
Mild volatile alkali, an ounce and a half.

Triturate them in a glaſs mortar, until, after the effervescence has entirely ceaſed, they unite into a maſs, which is to be wrapped up in bibulous paper, and dried upon a layer of gypſum, placed in warm ſand. It is afterwards to be kept in a phial, cloſed with a glaſs ſtopper.

The difference between the proportions of the ingredients of this preparation, directed by the two colleges, is very ſtriking. We know of no experiments to aſcertain which of them is moſt correct. It may ſeem ſtrange that directions are given ſo particularly concerning the manner of drying a mixture which is prepared by rubbing two dry ſubſtances together. But ſuch a phenomenon is by no means uncommon, and ariſes from the quantity of water of cryſtallization contained in the ingredients being greater than what is required by the new compound formed: as ſoon, therefore, as the ingredients begin to act upon each other, a quantity of water is ſet at liberty, which renders the maſs moiſt.

The nature of this compound, and conſequently the name which ſhould be given it, are not yet ſufficiently aſcertained. Prepared according to the directions of the colleges, it evidently contains oxide of copper, ammonia, and ſulphuric acid. If theſe ſubſtances be chemically combined, it ſhould be denominated the Sulphate or Sub-ſulphate of copper and ammonia. By the expoſure to the air during its exſiccation, and by keeping, it is apt to loſe its blue colour entirely, and become green, and is probably converted into carbonate of copper.

There is another way of preparing this ſubſtance, leſs economical indeed, but more inſtructive to the ſtudent of chemiſtry, and leſs liable to variety in the product. Into a ſaturated ſolution of ſulphate of copper, drop a ſolution of carbonate of ammonia, or, what is better, water of ammonia, until the bluiſh green precipitate, which is formed at firſt, be rediſſolved, and the liquor regain its tranſparency, and become of a beautiful deep blue colour. Concentrate this ſolution by evaporation, and mix it with about an equal quantity of alcohol, upon which the ſalt immediately precipitates in ſilky blue cryſtals, which are to be collected by filtration, dried, and kept in a phial with a ground-glaſs ſtopper.

Ammonia, having a ſtronger affinity for ſulphuric acid than oxide of copper has, ſeparates the oxide, which, being inſoluble, is precipitated in the form of a bluiſh green powder. But as this oxide itſelf is ſoluble in ammonia, it is rediſſolved when more ammonia is added than is ſufficient to ſaturate the acid. Inſtead of obtaining the compound thus formed in a dry ſtate by evaporation, which would partly decompoſe it, advantage is taken of its inſolubility in alcohol, which, from its more powerful affinity, ſeparates the water of the ſolution, and precipitates the cupreous ſalt in ſilky blue cryſtals. When a ſufficient quantity of alcohol has been employed, it merely abſtracts the water of the ſolution, and precipitates the whole of the ſaline matter contained in it, which we are therefore diſpoſed to conſider as a ternary compound of ſulphuric acid, oxide of copper, and ammonia. By drying, this precipitate undergoes ſome alteration, for it is no longer totally ſoluble in water. As, however, the ſolution is eaſily effected by the addition of ammonia, it would appear that the alteration conſiſts in the decompoſition of part of the ammonia.

Medical uſe.—This preparation has ſometimes been ſerviceable in epilepſies; but, from its frequent want of ſucceſs, and the diſagreeable conſequences with which its uſe is ſometimes attended, it has not lately been much preſcribed. It is employed by beginning with doſes of half a grain, twice a-day; and increaſing them gradually to as much as the ſtomach will bear. Dr. Cullen ſometimes increaſed the doſe to five grains.

LIQUOR CUPRI AMMONIATI; olim, AQUA SAPPHARINA. *Dub.*

Liquor of Ammoniated Copper, formerly *Sapphire Water*.

Take of
Lime water, freſh made, eight ounces;
Sal ammoniac, two ſcruples;
Verdegris prepared, four grains.
Mix and digeſt them for twenty-four hours, then pour off the pure liquor.

AQUA CUPRI AMMONIATI. *Lond.*

Water of Ammoniated Copper.

Take of
Lime water, one pint;
Sal ammoniac, one dram.
Let them ſtand together, in a copper veſſel, till the ammonia be ſaturated.

In this preparation the lime water decompoſes the muriate of ammonia and forms muriate of lime; while the ammonia diſengaged immediately re-acts upon the oxide of copper contained in the verdegris, and renders it ſoluble. But as the quantity of lime employed is not ſufficient to decompoſe all the muriate of ammonia, the ſolution contains muriate of ammonia, muriate of lime, and ammoniaret of copper, forming probably a triple ſalt, with the acetic acid. The mode of preparing this ſolution, adopted by the London college, is the remains of a fortuitous pharmacy, now juſtly exploded by the other colleges.

Medical uſe.—This compound ſolution is applied externally for cleaning foul ulcers, and diſpoſing them to heal. It has been recommended alſo for taking off ſpecks and films from the eyes; but when uſed with this intention, it ought to be diluted with ſome pure water, as in the degree of ſtrength in which it is here ordered, it irritates and inflames the eyes conſiderably.

CHAP. VIII.

IRON.

FERRI LIMITURA PURIFICATA. *Ed.*
Purified Filings of Iron.

Place a ſieve over the filings, and apply a magnet, ſo that the filings may be attracted upwards through the ſieve.

This proceſs does not fulfil the purpoſe for which it is intended. For the adheſion of a very ſmall particle of iron renders braſs and other metals attractable by the magnet. The filings of iron got from the ſhops of different artificers, which are always mixed with ſolder, and other metals, cannot be purified in this way, ſo as to render them fit for internal uſe; and indeed the only way they can be obtained ſufficiently pure, is by filing a piece of pure iron with a clean file.

Off. prep.—Hydroſulph. ammon. *Ed.*

FERRI OXIDUM NIGRUM PURIFICATUM; olim, Ferri Squamæ Purificatæ. *Ed.*
Purified Black Oxide of Iron, formerly *Purified Scales of Iron.*

Let the ſcales of the oxide of iron, which are to be found at the foot of the blackſmith's anvil, be purified by the application of a magnet. For the magnet will attract only the ſmaller and purer ſcales, and will leave thoſe which are larger and leſs pure.

Here the application of the magnet is uſeful, becauſe theſe ſcales contain no foreign metal, but are mixed with earthy and other impurities, which could be ſeparated in no other way.

CARBONAS FERRI; olim, Ferri Rubigo. *Ed.*
Carbonate of Iron, formerly *Ruſt of Iron.*

Moiſten purified filings of iron frequently with water, that they may be converted into ruſt, which is to be ground into an impalpable powder.

FERRI RUBIGO. *Lond.*

Ruſt of Iron.

Take of

Iron filings, one pound.

Expoſe theſe to the air, often moiſtening them with water until they be corroded into ruſt; then powder them in an iron mortar, and waſh over with diſtilled water the very fine powder. Moiſten the reſiduum, which is not reduced by moderate triture to a powder, which may be eaſily waſhed over, and expoſe it again to the air; and, laſtly, after having ground it in a mortar, waſh it over. Dry the powder which is waſhed over.

Dub.

Take of

Iron wire, any quantity.

Cut it into pieces, which are to be moiſtened frequently with water, and expoſed to the air until they be corroded into ruſt. Then powder them in an iron mortar, and by pouring water upon them, waſh over the fineſt part of the powder, which is to be dried. The ſame proceſs may be frequently repeated.

IRON is one of the moſt eaſily oxidized of the metals. It is capable of attracting oxygen from the air, and of decompoſing water even in the cold. By expoſure at the ſame time to air and moiſture, it is very quickly oxidized, while it alſo abſorbs carbonic acid, and is converted into a reddiſh brown pulverulent ſubſtance, well known by the name of ruſt of iron. For medical uſe it is prepared as the other ſubſtances inſoluble in water. Apothecaries ſeldom make it themſelves, but obtain it from perſons who manufacture it in large quantities.

Off. prep.—Tinctura ferri muriati, *Lond.*

CARBONAS FERRI PRÆCIPITATUS. *Ed.*

Precipitated Carbonate of Iron.

Take of

Sulphate of iron four ounces,

Carbonate of ſoda, five ounces.

Water, ten pounds.

Diſſolve the ſulphate in the water, and add the carbonate of ſoda, previouſly diſſolved, in a ſufficient quantity of water, and mix them thoroughly.

Waſh the carbonate of iron, which is precipitated, with warm water, and afterwards dry it.

ON mixing the ſolutions of theſe ſalts together, there is an immediate mutual decompoſition. Sulphate of ſoda is formed, which remains in ſolution, and carbonate of iron, which is precipitated of a green colour. The precipitate when firſt formed, is the carbonate of black oxide of iron, or contains the iron in the ſtate of black oxide, the ſtate in which it exiſts in the green ſulphate of iron; but in the proceſs of drying, it abſorbs more oxygen, becomes of a red colour, and is converted into the carbonate of red oxide of iron. As the precipitate is extremely light and bulky, it is not eaſily ſeparated by allowing it to ſubſide, and pouring off the clear liquor; filtration ſhould therefore be employed. The carbonate of ſoda is uſed in preference to the carbonate of potaſs, on account of the greater ſolubility of ſulphate of ſoda than of ſulphate of potaſs, which renders the ſubſequent ablution of the ſalt more eaſy.

The carbonate of iron is an excellent and ſafe chalybeate. It may be given in doſes from five grains to ſixty; but all chalybeates anſwer better in ſmall doſes, frequently repeated, than in large doſes.

AQUA FERRI AËRATI. *Dub.*

Water of Aërated Iron.

It is prepared in the ſame manner as the water of fixed air, by ſuſpending in the water half an ounce of iron wire.

This is a very elegant chalybeate. The iron is in the ſtate of black oxide, and is diſſolved by means of carbonic acid. It was firſt prepared by Bergmann, in imitation of the natural chalybeate waters, and it forms an excellent ſubſtitute for them.

SULPHAS FERRI. *Ed.*

Sulphate of Iron.

Take of

Purified filings of iron, ſix ounces;
Sulphuric acid, eight ounces;
Water, two pounds and a half.

Mix them, and after the effervefcence ceaſes, digeſt the mixture for ſome time upon warm ſand; then ſtrain the liquor through paper, and after due evaporation ſet it at reſt to cryſtallize.

FERRUM VITRIOLATUM. *Lond.*

Vitriolated Iron.

Take of

Filings of iron,
Vitriolic acid, each eight ounces;
Diſtilled water, three pints.

Mix them in a glaſs veſſel; and, when the efferveſcence has ceaſed, place the mixture for ſome time upon hot ſand; then pour off the liquor, ſtraining it through paper; and, after due evaporation, ſet it aſide to cryſtallize.

FERRUM VITRIOLATUM; olim, SAL MARTIS. *Dub.*
Vitriolated Iron, formerly *Salt of Steel.*

Take of
- Iron wire, two ounces,
- Vitriolic acid, three ounces and a half;
- Water, two pounds.

Mix the acid by degrees with the water in a glaſs veſſel, and gradually add the iron-wire cut into pieces; digeſt the mixture for ſome time, and ſtrain it through paper. Laſtly, ſet aſide the liquor, after due evaporation, to cryſtallize, by ſlow refrigeration.

ALTHOUGH the native ſulphate of iron may be purified by ſolution, filtration and cryſtallization, ſufficiently, for many purpoſes, yet it cannot be procured perfectly pure except by the direct union of ſulphuric acid and iron; and as it is of conſequence that it ſhould be pure when adminiſtered internally, directions for its preparation have been given by all the colleges. The differences which may be obſerved in the proportions of the materials employed, is of little conſequence, as ſulphuric acid and iron unite only in one proportion.

Iron ſcarcely acts upon ſulphuric acid, unleſs aſſiſted by heat. It then becomes oxidized, by abſtracting oxygen from a portion of the acid, and converting it into ſulphureous acid gas or ſulphur, and combines with the remainder of the acid. But it acts with great rapidity on diluted ſulphuric acid; in which caſe it is not oxidized at the expence of the acid itſelf, but by decompoſing the water, and therefore the hydrogen of the water is ſeparated in the form of gas. The action of the acid and iron upon each other often ceaſes before the acid is nearly ſaturated, and may be renewed by the addition of a little water. The reaſon is, that all the water which was not decompoſed is employed to diſſolve the ſulphate of iron formed.

The properties and uſes of ſulphate of iron have been already mentioned.

SULPHAS FERRI EXSICCATUS. *Ed.*
Dried Sulphate of Iron.

Take of
- Sulphate of iron, any quantity.

Expoſe it to the action of a moderate heat in an unglazed earthen veſſel, until it become white and perfectly dry.

The heat applied here muſt not be ſo great as to decompoſe the ſulphate of iron, but only to deprive it of its water of cryſtallization.

OXIDUM FERRI RUBRUM. *Ed.*
Red Oxide of Iron.

Expoſe dried ſulphate of iron to an intenſe heat, until it is converted into a very red matter.

By the violent heat applied in this preparation, the ſulphate of iron is completely decompoſed, and copious white fumes are expelled. The iron is converted into the red oxide; part of the ſulphuric acid is therefore reduced to the ſtate of ſulphureous acid, and the reſt of the acid is expelled in a very concentrated ſtate. This proceſs was formerly employed in this country, and ſtill is employed in Germany, for the preparation of ſulphuric acid; which, however, from the preſence of the ſulphureous acid, was poſſeſſed of ſome peculiar properties, ſuch as emitting fumes and cryſtallizing. The reſiduum is compoſed of red oxide of iron, combined with a little red ſulphate of iron, which renders it deliqueſcent. To obtain the oxide perfectly pure, the reſiduum muſt therefore be waſhed with water, and dried quickly, to prevent the abſorption of carbonic acid.

Off. prep.—Murias ammoniæ et ferri, *Ed.*

TINCTURA MURIATIS FERRI. *Ed.*
Tincture of Muriate of Iron.

Take of
Purified black oxide of iron in powder, three ounces;
Muriatic acid about ten ounces, or as much as may be ſufficient to diſſolve the powder.

Digeſt by a gentle heat, and after the powder is diſſolved, add as much
Alcohol as will make the whole quantity of liquor amount to two pounds and a half

Tinctura Ferri Muriati. *Lond. Dub.*
Tincture of Muriated Iron.

Take of
The ruſt of iron, (iron-wire, *Dub.*) half a pound.
Muriatic acid, three pounds;
Rectified ſpirit of wine, three pints

Pour the muriatic acid on the ruſt of iron in a glaſs-veſſel; and ſhake the mixture now and then during three days. Set it by, that the feces may ſubſide; then pour off the liquor; evaporate this to one pint, and, when cold, add to it the vinous ſpirit.

In making this preparation, each of the colleges uſes iron in a different ſtate; the Dublin college, metallic iron; the Edinburgh, the black oxide; and the London college, the carbonate of the red oxide. There is no difference between the ſolutions of iron and of its black oxide; becauſe the iron is converted into the ſtate of black oxide by the decompoſition of the water, before it is diſſolved; and accordingly, when iron is diſſolved in muriatic acid, there is a diſengagement of hydrogen gas; whereas the black oxide is diſſolved without any efferveſcence. But muriatic acid is capable of combining either with the black or red oxides of iron, and forms with each, ſalts, having diſtinctive properties.

The red muriate of iron is not cryſtallizable; has a dark orange colour; is deliqueſcent; forms a brown red ſolution, having a very aſtringent taſte; and is ſoluble in alcohol. The green muriate is cryſtallizable; has little colour; is very ſoluble in water, forming a pale green ſolution; and is inſoluble in alcohol. But the aqueous ſolution of green muriate attracts oxygen ſo rapidly from the atmoſphere, that unleſs the acceſs of the air be totally excluded, it is always partially converted into red muriate. The ſolutions of iron and of its black oxide, are accordingly found always to contain a greater or leſs proportion of red muriate, and are therefore not uniform or conſtant in their properties. Beſides, as it is only the red muriate which is ſoluble in alcohol, it appears to us that it is better, according to the directions of the London college, to uſe the red carbonate of iron, by which means we obtain an unmixed and permanent ſolution of the red muriate. Muriate of iron is alſo formed, when we diſſolve the ſulphuret of iron in muriatic acid for the purpoſe of procuring ſulphuretted hydrogen gas. It is alſo the reſiduum which remains in the retort after the ſublimation of muriate of ammonia and iron.

When well prepared, the alcoholic ſolution of muriate of iron has a yellowiſh colour, and very aſtringent taſte. It is an excellent chalybeate, and may be given in doſes, of ten or twenty drops twice or thrice a-day, in any proper vehicle.

MURIAS AMMONÆ ET FERRI; olim, FLORES MARTIALES. *Ed.*

Muriate of Ammonia and Iron; formerly *Martial Flowers.*

Take of
  Red oxide of iron, waſhed and again dried;
  Muriate of ammonia, equal weights;
Mix them thoroughly and ſublime.

FERRUM AMMONIACALE. *Lond.*

Ammoniacal Iron.

Take of
  Iron filings, one pound;
  Sal ammoniac, two pounds.
Mix and ſublime. What remains at the bottom of the veſſel mix by rubbing together with the ſublimed matter, and ſublime a ſecond time.

ALTHOUGH at a low temperature ammonia decompoſes the muriate of iron, at a high temperature iron and its oxides decompoſe muriate of ammonia. But as muriate of ammonia is itſelf a volatile ſalt, great part of it eſcapes undecompoſed; ſo that the product is a mixture of muriate of ammonia with red muriate of iron. According to the formula of the Edinburgh college, the decompoſition is effected by ſimple affinity. As ſoon as the oxide of iron acts on the muriate of ammonia, the ammonia which is ſeparated comes over: then as the heat increaſes, undecompoſed muriate of ammonia is ſublimed; which, as the proceſs advances, is mixed with an increaſing proportion of muriate of iron. In the proceſs of the London college, the decompoſition is more complex; and a conſiderable quantity of hydrogen gas is produced. Both colleges employ a much larger quantity of iron than is neceſſary. According to the German pharmaceutiſts, if the iron be equal to one ſixteenth of the muriate of ammonia, it is ſufficient. The new Pruſſian Diſpenſatory directs one ounce of iron to be diſſolved in two ounces of muriatic acid, and one of nitrous acid; this ſolution of red muriate of iron to be mixed with a watery ſolution of twelve ounces of muriate of ammonia, and the whole evaporated to dryneſs; and the dry maſs to be ſublimed in a wide-necked retort, with a heat increaſed to redneſs.

Whatever proceſs be employed, the heat muſt be applied as quickly as poſſible; and the ſublimed product thoroughly mixed by trituration, and kept in well-ſtopt glaſs veſſels. It ſhould have a deep orange colour, and a ſmell reſembling ſaffron, and ſhould deliqueſce in the air.

This preparation is ſuppoſed to be highly aperient and attenuating; though no otherwiſe ſo than the reſt of the chalybeates, or at moſt only by virtue of the ſaline matter joined to the iron. It has been found of ſervice in hyſterical and hypochondriacal caſes, and in diſtempers proceeding from a laxity, and weakneſs of the ſolids, as the rickets. From two or three grains to ten may be conveniently taken in the form of a bolus.

TINCTURA FERRI AMONIACALIS. *Lond.*

Tincture of Ammonical Iron.

Take of
Ammoniacal iron, four ounces;
Proof-ſpirit, one pint.
Digeſt and ſtrain.

This is merely a ſpiritous ſolution of the preceding article, and is a much leſs elegant medicine than the ſimple tincture of muriate of Iron.

FERRUM TARTARISATUM. *Lond.*

Tartarized Iron.

Take of
Filings of Iron, one pound;
Cryſtals of tartar, in powder, two pounds.
Mix them with diſtilled water into a thick maſs, which is to be expoſed to the action of the air for eight days in a wide glaſs veſſel; then grind the matter, after being dried in a ſand bath to a very minute powder.

This is in fact a triple tartrate of iron and potaſs, the exceſs of acid in the ſuper-tartrate of potaſs being ſaturated by oxide of iron. The iron is oxidized during the firſt part of the proceſs, in which it is moiſtened and expoſed to the action of the air.

Tartrate of potaſs and iron may alſo be formed, by boiling a ſolution of ſuper-tartrate of potaſs with iron, or, what is ſtill better, with ſome of the oxides of iron, until the exceſs of acid be ſaturated. The compound, according to Thenard, is very ſoluble, varies in colour according to the ſtate of the oxide; cryſtallizes in ſmall needles, and has a chalybeate taſte. It is not precipitated by alkalies or alkaline carbonates. It is decompoſed by ſulphuretted hydrogen and its compounds, and by gallic acid. The editors of Gren's Pharmacy ſay, that a ſolution of iron in ſuper-tartrate of potaſs, furniſhes by evaporation greeniſh ſpathoſe permanent cryſtals, difficultly ſoluble; which is ſurely a miſtake; at leaſt it neither correſponds with Thenard's account, nor with the old name of this preparation, Mars Solubilis.

The tartrate of iron and potaſs may be given in the form of powder or bolus, in doſes of from ten to thirty grains.

VINUM FERRI. *Lond.*

Wine of Iron.

Take of

Iron filings, four ounces;
Spaniſh white wine, four pints.

Digeſt for a month, often ſhaking the veſſel, and then ſtrain.

VINUM FERRATUM; olim, VINUM CHALYBEATUM. *Dub.*

Ironated Wine, formerly *Chalybeate Wine.*

Take of

Iron wire cut in pieces, four ounces;
White Rheniſh wine, four pints.

Digeſt for a month, often ſhaking the veſſel, and then ſtrain.

THIS is merely a ſolution of the preceding article in wine; for the iron is only diſſolved in the wine by means of the ſuper-tartrate of potaſs it contains. The Rheniſh wine directed by the Dublin college, will, therefore, diſſolve a larger quantity of iron than the Spaniſh white wine of the London college. But a ſolution of a known proportion of the preceding article in wine, will give a medicine of more equal powers, and may be made extemporaneouſly.

The doſe is from a drachm to half an ounce, repeated twice or thrice a-day in chlorotic caſes.

TINCTURA FERRI ACETATI. *Dub.*

Tincture if Acetated Iron.

Take of

Acetated vegetable alkali;
Vitriolated iron, each one ounce;
Alcohol, two pounds.

Rub the acetated alkali and vitriolated iron together in a glaſs mortar, until the maſs deliqueſces; then add, during the trituration, the alcohol, and ſtrain the ſolution.

THE acetate of potaſs and ſulphate of iron decompoſe each other, and form acetate of iron, and ſulphate of potaſs. But as the ſulphate of potaſs is not ſoluble in alcohol, the ſolution, after filtration, is an alcoholic ſolution of acetate of iron. The acetic acid is alſo capable of combining with both oxides of iron; and as the iron in the ſulphate is in the ſtate of black oxide, which has a ſtrong attraction for oxygen, it is probable that the acetate prepared in the way directed is a mixed acetate.

It has an extremely ſtyptic taſte, and is given in doſes of thirty or forty drops.

CHAP. IX.

MERCURY.

HYDRARGYRUM PURIFICATUM. *Dub.*

Purified Quickſilver.

Take of
Quickſilver, ſix pounds.
Draw off four pounds by ſlow diſtillation.

Hydrargyrus Purificatus *Lond.*

Purified Quickſilver.

Take of
Quickſilver,
Iron-filings, each four pounds.
Rub them together, and diſtil from an iron-veſſel.

Edin.

Take of
Quickſilver, four parts;
Filings of iron, one part.
Rub them together, and diſtil from an iron-veſſel.

The quickſilver of commerce is often adulterated with lead, tin, or other metals, which renders it unfit for internal uſe, and for many preparations. It therefore becomes neceſſary to purify it, and fortunately its comparatively great volatility ſupplies us with an eaſy proceſs. The Dublin college diſtil it ſimply without any addition; but, leſt towards the end of the proceſs the mercury ſhould elevate any impurities along with it, they draw off but two thirds. The principal objection to this proceſs is the want of economy; for although the remaining third may be uſed for ſome purpoſes, its value is very much depreciated. As iron has a much ſtronger affinity for almoſt all the ſubſtances with which quickſilver may be adulterated than quickſilver has, by adding iron-filings we may draw off the whole quickſilver by diſtillation, without any fear of the impurities riſing along with it. The London college add an equal weight of iron-filings, but ſo large a quantity cauſes the ſize of the diſtilling apparatus to be unneceſſarily increaſed. The Edinburgh college uſe one fourth, which is certainly enough.

Glaſs-retorts are inadmiſſible in this diſtillation; becauſe, when the mercury begins to boil, the concuſſion is ſo great, that they would certainly be broken. Iron-retorts are the beſt, although ſtrong earthen ones may be alſo uſed. The receiver may be of the ſame materials, or of glaſs, if we wiſh to inſpect the progreſs of the operation; but in this caſe we muſt interpoſe an adopter between the retort and receiver, and fill the receiver nearly full of water, that the mercury may not crack it by falling hot into it. The retort employed ſhould be ſo large, that the quickſilver ſhould not fill above one third of it.

ACETIS HYDRARGYRI. *Edin.*

Acetite of Quickſilver.

Take of

Purified quickſilver, three ounces;

Diluted nitrous acid, four ounces and a half, or a little more than may be required for diſſolving the mercury;

Acetite of potaſs, three ounces;

Boiling water, eight pounds.

Mix the quickſilver with the diluted nitrous acid; and after the effervеſcence has ceaſed, digeſt if neceſſary with a gentle heat, until the quickſilver be entirely diſſolved. Then diſſolve the acetite of potaſs in the boiling water, and immediately to this ſolution, ſtill hot, add the former, and mix them by agitation. Then ſet the mixture aſide to cryſtallize. Place the cryſtals in a funnel, and waſh them with cold diſtilled water; and, laſtly, dry them with as gentle a heat as poſſible.

HYDRARGYRUS ACETATUS. *Lond.*

Acetated Quickſilver.

Take of

Purified quickſilver,

Diluted nitrous acid, each half a pound;

Acetated kali, three ounces;

Tepid diſtilled water, two pounds.

Mix the quickſilver with the diluted nitrous acid in a glaſs-veſſel, and digeſt them for twenty-four hours with a gentle heat, that the quickſilver may be diſſolved. Pour the nitrated quickſilver thus prepared into the acetated kali, previouſly diſſolved in the tepid (90°) water, that acetated quickſilver may be formed, which is to be firſt waſhed with cold diſtilled water, and afterwards diſſolved in a ſufficient quantity of boiling diſtilled water. Filter this ſolution through paper, and ſet it aſide to cryſtallize.

HYDRARGYRUM ACETATUM. *Dub.*
Acetated Quickſilver.

Take of
Purified quickſilver,
Diluted nitrous acid, each half a pound;
Acetated vegetable alkali, three ounces;
Diſtilled water, heated to about the ninetieth degree, two pounds and a half.

Diſſolve the mercury in the acid with a gentle heat. Mix the liquor, before cryſtals form in it by cooling, with the water in which the acetated vegetable alkali has been previouſly diſſolved. Waſh the precipitate with cold diſtilled water, then pour upon it twenty-four pounds of diſtilled water, and boil a little. Having removed the veſſel from the fire, let it ſtand at reſt for about ten minutes; and, laſtly, pour off from the ſediment the clear liquor, and let the acetated quickſilver cryſtallize in its ſlow refrigeration.

THESE proceſſes are all fundamentally the ſame. They differ chiefly in the proportions. Thoſe of the Edinburgh college were aſcertained by very careful experiment, and if its directions be accurately followed, the preparation ſucceeds admirably. Nitrate of mercury is decompoſed by acetate of potaſs; and the products are acetate of mercury and nitrate of potaſs. The nitrate of potaſs being much more ſoluble than the acetate of mercury, remains in ſolution after the latter is ſeparated by cryſtallization. Mercury is capable of forming different combinations with nitrous acid, which poſſeſs each their characteriſtic properties. When we employ a ſufficient quantity of acid to diſſolve the mercury without the aſſiſtance of heat, and to retain it in ſolution, there is always an exceſs of acid; and therefore it is a ſolution of ſuper-nitrate of mercury. If we evaporate this ſolution very gently, or if we employ a larger proportion of mercury at firſt, and aſſiſt the action of the acid by a gentle heat, we obtain nitrate of mercury cryſtallized in various forms. In theſe the mercury is in the ſtate of protoxide. But if we aſſiſt the action of the acid by boiling, the mercury is converted into peroxide, and a larger quantity is diſſolved. This ſolution is very apt to cryſtallize, both on cooling and by the diminution of the quantity of acid during the proceſs; and if we attempt to dilute the ſolution with water, a copious precepitate of ſub-nitrate of mercury immediately takes place, and the ſolution contains ſuper-nitrate of mercury. If the dilution be made with cold water, the ſub-nitrate has a white colour, which, by a very ſlight application of heat, paſſes to a beautiful yellow, the colour which it has at firſt when ſeparated by boiling water. An oppoſite, but we believe leſs correct, opinion is entertained by Mr. Chenevix, who aſſerts that it is leſs oxidized, becauſe ſuper-nitrate of mercury, prepared without heat, is capable, when heated to ebullition, of diſſolving an additional quantity of mercury without the formation of any nitrous gas.

For making the acetate of mercury, the nitrate is prepared with a very gentle heat, and with exceſs of acid, that it may be retained in perfect ſolution, and that there may be no poſſibility of any admixture of ſub-nitrate with the acetate formed. A larger proportion of acid is uſed by the Edinburgh college than by the other colleges, but by careful experiment it was aſcertained to be neceſſary for the ſucceſs of the proceſs. In mixing the ſolutions, we muſt be careful to pour the mercurial ſolution into that of the acetate of potaſs, becauſe, by adopting the contrary procedure, the ſub-nitrate of mercury will be precipitated undecompoſed, if any peroxide be contained in the mercurial ſolution. For diſſolving the acetate of potaſs, the London and Dublin colleges only uſe as much water as is capable of retaining the nitrate of potaſs in ſolution; the acetate of mercury is therefore precipitated, and is purified by again diſſolving it in boiling water and cryſtallizing it. This part of the proceſs is ſimplified by the Edinburgh college, who uſe as much water for diſſolving the acetate of potaſs as is capable of retaining, as long as it is hot, the acetate of mercury in ſolution, and of allowing it to cryſtallize as it cools. In this way, therefore, it is procured at once ſufficiently pure. The exſiccation of the acetate of mercury is an operation of great delicacy; for it is ſo ſpongy, that it retains the moiſture with great obſtinacy; and it is decompoſed ſo eaſily, that heat can ſcarcely be employed. It is beſt dried by compreſſing it between ſeveral folds of bibulous paper.

Acetate of mercury is ſcarcely ſoluble in cold water, but diſſolves readily in boiling water. It generally cryſtallizes in micaceous plates, and is extremely eaſy of decompoſition.

It is ſuppoſed to be a mild preparation of mercury, and was the active ingredient of the celebrated Keyſer's pills. In ſolution it has alſo been recommended externally, to remove freckles and cutaneous eruptions

MURIAS HYDRARGYRI; olim, MERCURIUS SUBLIMATUS CORROSIVUS. *Edin.* HYDRARGYRUS MURIATUS. *Lond.* HYDRARGYRUM MURIATUM CORROSIVUM. *Dub.*

Muriate of Quickſilver, formerly *Corroſive Sublimate. Muriated Quickſilver. Corroſive Muriated Quickſilver.*

Take of
Purified quickſilver, two pounds;
Sulphuric acid, two pounds and a half;
Dried muriate of ſoda, four pounds.

Boil the quickſilver with the ſulphuric acid in a glaſs veſſel placed in a ſand bath, until the matter be dried. Mix the matter when cold in a glaſs veſſel, with the muriate of ſoda; then ſublime in a glaſs cucurbit, with a heat gradually increaſed. Laſtly, ſeparate the ſublimed matter from the ſcoriæ.

By boiling the quickſilver to dryneſs with ſulphuric acid, the metal is oxidized by the decompoſition of part of the acid, and combines with the reſt to form ſub-ſulphate of quickſilver. In the ſecond part of the proceſs, this ſub-ſulphate is decompoſed by dried muriate of ſoda, muriate of quickſilver ſublimes, and ſulphate of ſoda remains behind. In Holland it is manufactured by ſubjecting to ſublimation a mixture of dried ſulphate of iron, nitrate of potaſs, muriate of ſoda, and quickſilver. In the former editions of the Edinburgh Pharmacopœia, the mercury was oxidized by boiling it to dryneſs in nitrous acid, and then ſublimed with muriate of ſoda and ſulphate of iron. Bergmann recommends the ſublimation of ſub-nitrate of mercury and muriate of ſoda, and Mr. Murray ſeems inclined to prefer it to the new proceſs.

Muriate of quickſilver cryſtallizes by ſublimation in priſmatic needles, forming a white ſemi-tranſparent maſs. It is ponderous. Its taſte is acrid, ſtypic, and durable. Is is ſoluble in 20 parts of cold water, and in 2 at 212°. It is alſo ſoluble in 3.8 parts of alcohol at 70°, and in almoſt an equal weight of boiling alcohol. It gives a green colour to ſyrup of violets. It is not altered by expoſure to the air, and is ſublimed unchanged by heat. It is not decompoſed by any of the acids; but is ſoluble, without alteration, in the ſulphuric, nitric, and muriatic acids. It is precipitated by all the alkalies and earths, of an orange-yellow colour, which gradually changes to a brick red; and by their carbonates, of a permanent yellow colour. Ammonia forms with it an inſoluble, white, triple ſalt. It is alſo decompoſed by ſeveral of the metals. It conſiſts, according to Mr. Chenevix, of

Quickſilver	69.7	Oxide of mercury	82
Oxygen	12.3		
		Muriatic acid	18
			100

And the oxide therefore conſiſts of

Quickſilver	85
Oxygen	15
	100

Medical uſe.—Muriate of mercury is one of the moſt violent poiſons with which we are acquainted. Externally it acts as an eſcharotic or a cauſtic; and in ſolution it is uſed for deſtroying fungous fleſh, and for removing herpetic eruptions; but even externally it muſt be uſed with very great caution. It has, however, been recommended to be given internally, by the reſpectable authorities of Boerhaave and Van Swieten; and it is the active ingredient of all the empyrical antivenereal ſyrups. Were it really capable of curing the venereal diſeaſe, or equal in efficacy to the common modes of adminiſtering mercury, it would poſſeſs many advantages over them in other reſpects: but that it cannot be depended upon, is almoſt demonſtrated by its uſe as an antivenereal being very much confined to the quacks, and by the teſtimony of the moſt experienced practitioners. Mr. Pearſon ſays, that it will ſometimes cure the primary ſymptoms of ſyphilis, eſpecially if it produce conſiderable ſoreneſs of the gums, and the common effects of mercury; but that it will often fail in removing a chancre; and where it has removed it, that the moſt ſteady perſeverence will not ſecure the patient from a conſtitutional affection. It is on ſome occaſions, however, a uſeful auxiliary to a mercurial courſe, in quickly bringing the ſyſtem under the influence of mercury, and in ſupporting its action after the uſe of frictions, and is peculiarly efficacious in relieving venereal pains, in healing ulcers of the throat, and in promoting the deſquamation of eruptions.

Off. prep.—Sub-murias hydrarg. *Ed. Lond. Dub.* Calx. hydr. alba. *Lond.*

SUB-MURIAS HYDRARGYRI; olim, CALOMELAS. *Edin.*

Sub-muriate of Quickſilver, formerly *Calomel.*

Take of

Muriate of quickſilver, ground to powder in a glaſs-mortar, four ounces;

Purified quickſilver, three ounces.

Rub them together in a glaſs-mortar, with a little water, to prevent the acrid powder from riſing, until the mercury be extinguiſhed; and having put the powder, after being dried, into an oblong phial, of which it fills only one third, ſublime from warm ſand. After the ſublimation is finiſhed, having broken the phial, throw away both the red matter found near the bottom of the phial, and the white matter near its neck, and ſublime the reſt of the maſs. Grind this into a very minute powder, which is laſtly to be waſhed with boiling diſtilled water.

HYDRARGYRUM MURIATUM MITE SUBLIMATUM. *Dub.*
Mild Sublimated Muriated Quickſilver.

Take of
Corroſive muriated mercury, one pound;
Purified quickſilver, nine ounces.

Rub them together until the globules diſappear, and ſublime. Rub the ſublimed matter with the reſiduum, and repeat the ſublimation. Laſtly, waſh the ſublimed matter with frequent affuſions of boiling diſtilled water.

CALOMELAS. *Lond.*
Calomel.

Take of
Muriated quickſilver, one pound;
Purified quickſilver, nine ounces.

Rub them together, until the globules diſappear and ſublime; then rub the whole matter again together and ſublime. Repeat the ſublimation in the ſame manner four times. Afterwards triturate the matter into a very ſubtile powder, and waſh it by the affuſion of boiling diſtilled water.

WHEN quickſilver is triturated with muriate of quickſilver, it abſtracts from the oxidized quickſilver of the muriate a part of its oxygen, and the whole maſs aſſumes a blackiſh grey colour. When this is expoſed to a degree of heat ſufficient to convert it into vapour, the action of the different portions of quickſilver upon each other, and upon the muriatic acid, is much more complete: and the whole is converted into a ſolid white maſs, conſiſting of mercury in a ſtate of leſs oxidizement, and combined with leſs acid than in the muriate.

The trituration of the muriate of mercury is a very noxious operation, as it is almoſt impoſſible to prevent the finer particles from riſing and affecting the operator's eyes and noſtrils. To leſſen this evil, the Edinburgh college direct the addition of a little water. In the ſecond part of the proceſs, when the heat is applied, a ſmall portion of quickſilver and undecompoſed muriate firſt ariſe, and condenſe themſelves in the higheſt part or neck of the phial; then the ſubmuriate riſes, and, being leſs volatile, condenſes in the upper half of the body, while a ſmall quantity of quickſilver, in a ſtate of conſiderable oxidizement, remains fixed, or near the bottom. The Edinburgh college ſeparate the ſub-muriate from the other matters, and ſublime it again. The other colleges triturate the whole together again, and re-ſublime it, the Dublin college once, the London four times. As in the firſt ſublimation, a portion of the quickſilver and of the muriate of quickſilver always ariſe undecompoſed, a ſecond ſublimation is neceſſary, eſpecially if we triturate the whole products of the firſt ſublimation together; but any further repetition of the proceſs is perfectly uſeleſs. Leſt any portion of muriate ſhould have eſcaped decompoſition, the ſubmuriate muſt be edulcorated with boiling diſtilled water, until the water which comes off forms no precipitate with alkalies.

Submuriate of mercury is generally obtained in the form of a white ſolid maſs; but is capable of cryſtallizing in tetrahedral priſms terminated by pyramids. It has no taſte, and is ſcarcely ſoluble in water or in alcohol. It is leſs volatile than muriate of mercury. It is blackened by light, and becomes brown when triturated with lime water or the alkalies. It is converted by oxymuriatic acid into muriate of quickſilver. According to Mr. Chenevix, it conſiſts of

Quickſilver,	79	Oxide of quickſilver,	88.5
Oxygen,	9.5		
		Muriatic acid,	11.5
			100

And its oxide contains,	Quickſilver,	89.3
	Oxygen,	10.7
		100

By comparing this analyſis with that of the muriate of mercury, 54 parts of quickſilver ſeem in fact ſufficient to convert 100 of the muriate into ſubmuriate; but with Mr. Chenevix we think the exceſs employed by the colleges a uſeful precaution.

Medical uſe.—The ſubmuriate of quickſilver is one of the beſt mercurials we poſſeſs. By proper management it may be made to increaſe, in a remarkable manner, almoſt any of the ſecretions or excretions. One grain mixed with ſugar, and ſnuffed up the noſtrils, is recommended as a powerful errhine in amauroſis. The ſame mixture is blown into the eye, to remove ſpecks from the cornea. Given in doſes of one grain morning and evening, or in larger doſes combined with opium, to prevent it from acting as a purgative, it excites ptyaliſm. In larger doſes of five grains and upwards, it is an excellent purgative. Combined with diuretics, it proves diuretic, and with ſudorifics, ſudorific.

It is one of the preparations of mercury which is capable of curing ſyphilis in every form. It alſo produces very powerful and ſalutary effects in obſtructions and chronic inflammations of the viſcera, eſpecially of the liver; and, in general, it is applicable to every caſe in which mercurials are indicated.

Off. prep.—Pulv. ſcam. cum calom. *Lond.* Pulv. ſtibii comp. *Dub.*

SUB-MURIAS HYDRARGYRI PRÆCIPITATUS. *Ed.*

Precipitated Sub-muriate of Quickſilver.

Take of
Diluted nitrous acid,
Purified quickſilver, each eight ounces;
Muriate of ſoda, four ounces and a half;
Boiling water, eight pounds.

Mix the quickſilver with the diluted nitrous acid, and towards the end of the efferveſcence digeſt with a gentle heat, frequently ſhaking the veſſel in the meantime. But it is neceſſary to add more quickſilver to the acid than it is capable of diſſolving, that a perfectly ſaturated ſolution may be obtained.

Diſſolve at the ſame time the muriate of ſoda in the boiling water, and into this ſolution pour the other while ſtill hot, and mix them quickly by agitation, pour off the ſaline liquor after the precipitate has ſubſided, and waſh the ſub-muriate of quickſilver by repeated affuſions of boiling water, which is to be poured off each time after the depoſition of the ſub-muriate, until the water come off taſteleſs,

HYDRARGYRUS MURIATUS MITIS. *Lond.*

Mild Muriated Quickſilver.

Take of
Purified quickſilver,
Dilute nitrous acid, of each half a pound.

Mix in a glaſs-veſſel, and ſet it aſide until the quickſilver be diſſolved. Let them boil, that the nitrated quickſilver may be diſſolved. Pour out the boiling liquor into a glaſs-veſſel, containing another boiling liquor, conſiſting of
Muriatic ſalt, four ounces;
Diſtilled water, eight pints.

After the powder has ſubſided to the bottom of the veſſel, pour off the clear ſupernatant liquor, and waſh the powder which remains behind, till it becomes inſipid, with frequent affuſions of hot water; then dry it on blotting-paper with a gentle heat.

HYDRARGYRUM MURIATUM MITE PRÆCIPITATUM. *Dub.*

Precipitated Mild Muriated Quickſilver.

Take of
Purified quickſilver, ſix ounces and a half;

Diluted nitrous acid, ſix ounces.

Digeſt in a glaſs veſſel with a moderate heat for ſix hours, occaſionally agitating it. Towards the end of the ſolution, increaſe the heat ſo as to make the liquor boil for a little, which is then to be poured off from the quickſilver remaining undiſſolved, and mixed with ten pounds of boiling water, in which four ounces of common ſalt have been previouſly diſſolved. Waſh the powder which ſubſides to the bottom with warm diſtilled water, as long as the liquor decanted from it is rendered turpid from the addition of a few drops of mild ley.

In the firſt part of this proceſs, a ſolution of nitrate of quickſilver, with exceſs of oxide, is formed. In the ſecond, there is a mutual decompoſition of this nitrate, and of the muriate of ſoda; nitrate of ſoda is formed, and muriate of quickſilver, with exceſs of oxide. In this preparation, our object is to obtain the inſoluble compound which reſults from the combination of the protoxide of mercury with muriatic acid. In this view, the application of heat in diſſolving the mercury in the nitrous acid, is improper; for a portion at leaſt of the mercury is converted into its peroxide, which occaſions, in the firſt place, the formation of a little ſub-nitrate of mercury, when poured into the ſaline ſolution; and ſecondly, the formation of a quantity of muriate of mercury (corroſive ſublimate) which muſt be waſhed away. Accordingly, Mr. Murray has found much more mild and leſs corroſive muriate of mercury is formed when the ſolution is made ſlowly and in the cold, than when the directions of the colleges are complied with.

When properly prepared, the ſub-muriate obtained by precipitation ſcarcely differs from that obtained by ſublimation. Göttling found no other difference than that the precipitated ſub-muriate became grey, when triturated with lime-water, whereas the ſublimed ſub-muriate becomes black. But he expoſed to heat half an ounce of the precipitated ſub-muriate in a ſubliming apparatus; ſcarcely a grain of a reddiſh matter remained fixed; and the ſublimed matter now became black when triturated with lime-water, and differed in no reſpect from ſub-muriate prepared in the ordinary way by ſublimation. It therefore would ſeem to be an improvement in the proceſs, to ſublime the ſub-muriate after it is precipitated; eſpecially as by that operation it would be moſt effectually ſeparated from any ſub-nitrate which might be mixed with it.

There is ſtill another way of preparing the ſub-muriate of mercury, without uſing corroſive ſublimate, which muſt be noticed. It was contrived by Hermbſtaedt, and is recommended by Moench with the confidence derived from experience. as the very beſt proceſs for preparing the ſub-muriate of quickſilver.

Take
Pure quickſilver, ſeven ounces and a half;
Sulphuric acid, four ounces;
Dried muriate of ſoda, five ounces and a half.

Diſtil in a glaſs-retort the ſulphuric acid, with four ounces of the quickſilver, until they be converted into a dry white maſs. Triturate the ſulphate of mercury thus formed, with the remaining three ounces and a half of quickſilver, until the globules diſappear; then add the muriate of ſoda; mix them and ſublime. As the product of the firſt ſublimation ſtill contains unoxidized quickſilver, it is to be again triturated and ſublimed. The ſublimate being waſhed, is now pure ſub-muriate of quickſilver, and weighs about ſix ounces.

The theory of this proceſs is the ſame with that of the formation of the muriate of quickſilver. The difference between the two products ariſes from the proportion of quickſilver being greater, and that of the muriate of ſoda employed being leſs. We are not prepared to ſtate the comparative economy of theſe three proceſſes deſcribed, for preparing ſub-muriate of quickſilver; but of the laſt proceſs, we may obſerve, that according to Mr. Chenevix's analyſis, ſeven ounces and a half of quickſilver ſhould furniſh nine ounces and a half of ſub-muriate of quickſilver; ſo that there is evidently a conſiderable loſs, which muſt be owing either to the formation of muriate of quickſilver, or of oxide of quickſilver. To diminiſh this loſs, we might diſſolve the reſiduum of the firſt ſublimation, which is principally ſulphate of ſoda, in the water with which the ſublimate was waſhed, and precipitate the ſolution with carbonate of ſoda. We ſhould thus regain the remaining portion of the quickſilver in the ſtate of brown carbonate, which might be applied to many purpoſes. The ſame thing might be practiſed with advantage on the waſhings and reſiduums of ſeveral of the other preparations.

CALX HYDRARGYRI ALBA. *Lond.*
White Calyx of Quickſilver.

Take of
Muriated quickſilver,
Sal ammoniac,
Water of prepared kali, each half a pound.

Diſſolve firſt the ſal ammoniac, afterwards the muriated quickſilver in diſtilled water, and add to theſe the water of prepared kali. Waſh the powder until it become inſipid.

When to a ſolution of muriate of ammonia, there is added muriate of quickſilver, about thirty times more of the latter is diſſolved than the ſame quantity of pure water is capable of diſſolving; and there takes place a conſiderable increaſe of temperature. Now, as theſe facts ſufficiently prove a reciprocal action of the two ſalts, and as there is no decompoſition, it is evident that they muſt have combined to form a triple ſalt; eſpecially as they cannot be again ſeparated either by ſublimation or cryſtallization. This compound may therefore, with propriety, be termed Muriate of Mercury and Ammonia. It is the Sal Alembroth of the alchemiſts. It is very ſoluble in water, and is ſublimed by heat without decompoſition. When to a ſolution of this ſalt we add a ſolution of an alkaline carbonate, there occurs a partial decompoſition. The alkali combines with a portion of the muriatic acid; and reduces the muriate of mercury and ammonia to the ſtate of a ſub-muriate, which, being inſoluble, falls to the bottom of the ſolution.

The ſub-muriate of mercury and ammonia thus precipitated, has at firſt an earthy and afterwards a metallic taſte. It is not ſoluble in water. It is decompoſed by heat; furniſhing water, ammonia, and nitrogen gas, while 0.86 of ſub-muriate of mercury remains behind. Sulphuric and nitric acids partially decompoſe it, and convert it into muriate of mercury, and triple ſalts of mercury and ammonia. Muriatic acid diſſolves it, and converts it into muriate of quickſilver and ammonia. According to Fourcroy's analyſis, it conſiſts of 81 oxide of mercury,
16 muriatic acid,
3 ammonia.

100

Therefore, if the analyſis of the different muriates be correct, there is an unneceſſary want of economy in uſing equal parts of muriate of ammonia and muriate of mercury; for by calculation, at leaſt, we ſhould employ only one part of the former to eight of the latter.

It is only uſed for ointments; and its principal recommendation is its fine white colour.

Off. prep.—Ungt. calcis hydrarg. alb. *Lond.*

OXIDUM HYDRARGYRI CINEREUM. *Ed.*

Aſh-coloured Oxide of Quickſilver.

Take of
Purified quickſilver, four parts;

Diluted nitrous acid, five parts;
Diſtilled water, fifteen parts;
Water of carbonate of ammonia, a ſufficient quantity.

Diſſolve the mercury in the nitrous acid; then gradually add the diſtilled water, and pour into the mixture as much water of the carbonate of ammonia as ſhall be ſufficient to precipitate the whole of the oxide of mercury, which is then to be waſhed with pure water and dried.

PULVIS HYDRARGYRI CINEREUS. *Dub.*
Aſh-coloured Powder of Quickſilver.

Take of
Quickſilver, two ounces;
Diluted nitrous acid, two ounces and a half.

Diſſolve the quickſilver with a moderate heat, and dilute the liquor with eight ounces of cold diſtilled water; then drop into it an ounce and a half of the liquor of mild volatile alkali, or as much as may be ſufficient to precipitate the metal, which is to be waſhed with frequent affuſions of warm water, and afterwards dried.

THESE proceſſes, which are eſſentially the ſame, are intended to furniſh a ſubſtitute for the black oxide of quickſilver, on which the efficacy of the mercurials moſt frequently employed, and moſt certainly uſeful, depends. In theſe, the mercury is oxidized by trituration, in contact with the atmoſphere; but this operation is both ſo tedious and troubleſome, that it is often imperfectly performed or aſſiſted by improper means.

In the proceſſes we are now explaining, it was ſuppoſed that as ammonia has a ſtronger affinity for nitric acid than oxide of mercury has, it would ſeparate oxide of mercury from its ſolution in nitric acid; and, therefore, that the precipitate obtained was oxide of mercury ſimilar to that formed by trituration. But ſince the nature of the triple metalline ſalts has been better underſtood, this has been diſcovered to be an error, although the exact mode of their action is not yet explained. The grey precipitate which is formed, may, ſpeaking generally, be called a ſub-nitrate of mercury and ammonia; for it conſiſts of oxide of mercury and ammonia, not ſaturated with nitric acid; but even to ocular inſpection it does not ſeem to be homogeneous; and when it is digeſted in acetic acid, it is partially diſſolved, and the reſiduum acquires a very pale, or almoſt white colour. The portion diſſolved ſeems to be black oxide, and the white reſiduum to be pure ſub-nitrate of mercury and ammonia, which, according to Fourcroy, cryſtallizes in brilliant polyhedral cryſtals, without ſmell, of an extremely ſtyptic taſte, ſcarcely ſoluble in water, is decompoſed by heat, by the ſulphuric and muriatic acids, and by lime, potaſs, and ſoda, and conſiſts of 68.20 oxide of mercury, 16 of ammonia, and 15.80 of nitric acid. According to theſe obſervations, this preparation ought not to be called the grey oxide of mercury, and is not identical with the black oxide of mercury, prepared by trituration. If, however, it anſwered the ſame purpoſes, the identity would be of little conſequence; but from its never having been introduced into general uſe, although ſo much more eaſily prepared, we may preſume that it is not equal in point of efficacy.

Black oxide of mercury may however be obtained, according to the direction of Saunders, by triturating with lime water, and ſubſequent edulcoration, the ſublimed ſub-muriate of mercury, or rather the precipitated ſub-muriate, as propoſed by Göttling; and that the decompoſition may be more eaſy and complete, we ſhall venture to ſuggeſt, that for this preparation the latter ſub-muriate ſhould not be dried, but ſhould be triturated with the lime water as ſoon as it is edulcorated. This ſimple black oxide certainly merits a fair trial.

Off. prep.—Ungt. oxidi hydrarg. cinerei, *Ed.*

HYDRARGYRUS CUM CRETA. *Lond.*

Quickſilver with Chalk.

Take of

Purified quickſilver, three ounces;

Prepared chalk, five ounces.

Triturate them together until the globules diſappear.

Quicksilver has a ſtrong affinity for oxygen, and abſorbs it ſlowly from the atmoſphere. But the combination may be conſiderably accelerated by agitation, and ſtill more by triturating quickſilver with any ſubſtance which promotes its mechanical diviſion, and thus increaſes its ſurface. With this view, quickſilver is triturated with viſcid ſubſtances, as fats, honey, ſyrup, &c. or with pulverulent ſubſtances, as the chalk in the preſent example.

In this ſtate of oxidizement, quickſilver contains about 0.04 of oxygen according to Fourcroy, is ſoluble in acids without the extrication of nitrous gas, and is eaſily reduced by heat, and even by light.

The black oxide is the mildeſt, but at the ſame time the moſt efficacious of the preparations of mercury. Combined with chalk it is not in general uſe; but in the form of the common mercurial pill and ointment, it is more employed than any other preparations of the ſame metal except calomel.

HYDRARGYRUM CALCINATUM. *Dub. Lond.*

Calcined Quickſilver.

Take of
Purified quickſilver, any quantity.
Put it into an open glaſs veſſel, with a narrow mouth and wide bottom. Expoſe this to about the ſix-hundredth degree of heat, until the metal be converted into red ſcales.

This is an extremely tedious, and therefore expenſive, operation, becauſe mercury is incapable of abſorbing from the atmoſphere the quantity of oxygen neceſſary to convert it into the red oxide, except when in the ſtate of vapour. But as the form of a veſſel, which will prevent the diſſipation and loſs of the mercurial vapour, will at the ſame time hinder the free acceſs and frequent renewal of the air, the operation can only proceed ſlowly. The veſſel moſt advantageouſly employed, is a wide, flat-bottomed matraſs, with a very narrow, and almoſt capillary, neck. Only ſo much mercury is introduced into it as will cover the bottom of the matraſs; and the veſſel is not inſerted in the ſand deeper than the mercury ſtands within it. A degree of heat is then applied ſufficient to cauſe a gentle ebullition in the mercury, which is thus alternately converted into vapour, and condenſed again in the upper part of the veſſel. While in the ſtate of vapour, it abſorbs the oxygen of the air contained in the veſſel: by which means it is gradually changed into a black, and then into a red, powder; but a complete converſion into the latter ſtate is not effected in leſs than ſeveral months.

Red oxide of quickſilver thus prepared, conſiſts of ſmall cryſtalline grains, of a deep red colour, and very brilliant ſparkling appearance. By heat it may be ſublimed in the form of a beautiful ruby-coloured vitrified ſubſtance. At a red heat it is decompoſed, giving out oxygen gas, while the metal is revived, and is immediately volatilized. It is ſoluble in ſeveral of the acids; and during its ſolution it does not decompoſe them or water. It is eaſily diſoxidized. It contains about 0.1 oxygen.

It is not only an acrid ſubſtance, violently purgative and emetic, but even cauſtic and poiſonous. Its internal uſe is proſcribed; but it is applied externally as an eſcharotic, being previouſly triturated to a very fine powder; or it is formed into a ſtimulating ointment with unctuous ſubſtances.

OXIDUM HYDRARGYRI RUBRUM PER ACIDUM NITRICUM; olim, MERCURIUS PRÆCIPITATUS RUBER. *Edin.*

Red Oxide of Quickſilver by Nitric Acid, formerly *Red Precipitated Mercury.*

Take of
Purified quickſilver, one pound;
Diluted nitrous acid, ſixteen ounces.

Diſſolve the quickſilver, and evaporate the ſolution, with a gentle heat, to a dry white maſs; which, after being ground into powder, is to be put into a glaſs cucurbuit, and to have a thick glaſs plate laid upon its ſurface. Then, having adapted a capital, and placed the veſſel in a ſand bath, apply a gradually increaſed heat, until the matter be converted into very red ſcales.

HYDRARGYRUS NITRATUS RUBER. *Lond.*
Red Nitrated Quickſilver.

Take of
Purified quickſilver,
Nitrous acid, of each one pound;
Muriatic acid, one drachm.

Mix in a glaſs veſſel, and diſſolve the quickſilver in a ſand bath; then raiſe the fire until the matter be converted into red cryſtals.

HYDRARGYRUM SUB-NITRATUM, *Dub.*
Sub-nitrated Quickſilver.

Take of
Purified quickſilver, twenty ounces;
Diluted nitrous acid, twenty-five ounces.

Mix them in a glaſs veſſel, and diſſolve the quickſilver with a moderate heat; then increaſe the fire until the matter be converted into red ſcales.

IN the the firſt part of theſe proceſſes a fully ſaturated nitrate of mercury is formed. In the ſecond part, the metal is oxidized to the maximum by the decompoſition of the acid. When a ſufficient heat is applied, the nitrate of mercury firſt melts, then exhales nitric oxide gas, and changes its colour ſucceſſively to yellow, orange, and brilliant purple red. If well prepared, it ſhould have a cryſtalline ſcaly appearance; and it is entirely volatile at a red heat, and ſoluble without any reſiduum in nitrous acid. According to Fourcroy, it contains no nitrous acid, unleſs a ſufficient heat has not been applied; but according to moſt other chemiſts it contains ſome nitrous acid; and differs from the red oxide prepared by the action of heat alone, in always being more acrid.

In an economical point of view, it is evident that no more acid ſhould be employed than what is abſolutely neceſſary. If, there fore, the proportion of the Dublin college be ſufficient, that of the London muſt be much too large. The addition of the ſmall quantity of muriatic acid directed by the London college, is ſaid to increaſe the beauty of its appearance. How it ſhould do ſo, we are at a loſs to conceive; for the muriatic acid having a ſtronger affinity for mercury than nitrous acid has, will form with it a portion of muriate of mercury, which, being comparatively volatile, will be diſſipated long before the nitrate of mercury is decompoſed. The uſe of the muriatic acid is therefore to be rejected as being uſeleſs and extravagant.

Off. prep.—Ungt. oxidi hydrarg. rubri, *Ed.*

SUB-SULPHAS HYDRARGYRI FLAVUS; olim, TURPETHUM MINERALE. *Edin.*

Yellow Sub-Sulphate of Quickſilver, formerly *Turpeth Mineral.*

Take of
- Purified quickſilver, four ounces;
- Sulphuric acid, ſix ounces.

Put them into a glaſs cucurbuit, and boil them in a ſand bath to dryneſs. Throw into boiling water the white matter, which is left in the bottom, after having reduced it to powder. A yellow powder will immediately be produced, which muſt be frequently waſhed with warm water.

HYDRARGYRUS VITRIOLATUS. *Lond.* HYDRARGYRUM SUB-VITRIOLATUM. *Dub.*

Vitriolated Quickſilver. Sub-Vitriolated Quickſilver.

Take of
- Purified quickſilver, one pound;
- Vitriolic acid, fifteen ounces. (A pound and a half. *Dub.*)

Having mixed in a glaſs veſſel, heat them by degrees until they unite, and dry the matter completely with a ſtrong fire. This matter, on the affuſion of a large quantity of hot diſtilled water, will immediately become yellow, and fall to powder. Rub the powder with this water in a glaſs mortar. After the powder has ſubſided, pour off the water, and waſh the powder with diſtilled water till it becomes inſipid. (Till, when poured off, it no longer forms any precipitate on the addition of a few drops of mild ley. *Dub.*)

THE action of ſulphuric acid on mercury has been examined with conſiderable attention by Fourcroy. In the cold they have no action on each other, but on the application of heat, the ſulphuric acid begins to be decompoſed, ſulphureous acid gas is extricated, and the metal is oxidized, and combines with the undecompoſed acid, forming with it a white ſaline maſs, covered with a colourleſs fluid. In this ſtate it reddens vegetable blues, is acrid and corroſive, does not become yellow by the contact of the air, and is not decompoſed by water either warm or cold. It is therefore ſuper-ſulphate of quickſilver, and the proportion of the acid in exceſs is variable.

By waſhing the ſaline maſs repeatedly with ſmall quantities of water, it is at laſt rendered perfectly neutral. It no longer reddens vegetable blues. It is white; it cryſtallizes in plates, or fine priſmatic needles; it is not very acrid; it is not decompoſed either by cold or boiling water, but is ſoluble in 500 parts of the former, and in about 250 of the latter. It is much more ſoluble in water acidulated with ſulphuric acid. The ſulphate of quickſilver conſiſts of 75 quickſilver, 8 oxygen, 12 ſulphuric acid, and 5 water.

But if, inſtead of removing the exceſs of acid from the ſuperſulphate of quickſilver, by waſhing it with water, we continue the action of the heat according to the directions of the colleges, there is a copious evolution of ſulphureous acid gas, and the ſaline reſiduum is converted into a white maſs, which therefore evidently contains both a larger proportion of mercury, and in a ſtate of greater oxidizement, than the ſalt from which it was formed. But this white ſaline maſs is farther analyſed by the affuſion of hot water; for one portion of it is diſſolved, while the remainder aſſumes the form of a beautiful yellow powder. The portion diſſolved is ſaid to contain exceſs of acid. The yellow powder is, on the contrary, a ſub-ſulphate.

The ſub-ſulphate of quickſilver has a bright yellow colour, a conſiderably acrid taſte, is ſoluble in 2000 parts of cold water, is alſo ſoluble in ſulphuric acid, ſlightly diluted, and is decompoſed by the nitric acid, and forms muriate of quickſilver with the muriatic acid, while the neutral ſulphate forms ſub-muriate. It oxidizes quickſilver, and is converted by trituration with it into a black powder. At a red heat it gives out oxygen gas, and the metal is revived. It conſiſts of 76 mercury, 11 oxygen, 10 ſulphuric acid, and 3 water.

It is a ſtrong emetic, and with this intention operates the moſt powerfully of all the mercurials that can be ſafely given internally. Its action, however, is not confined to the primæ viæ; it will ſometimes excite a ſalivation, if a purgative be not taken ſoon after it. This medicine is uſed chiefly in virulent gonorrhœas, and other venereal caſes, where there is a great flux of humours to the parts. Its chief uſe at preſent is in ſwellings of the teſticle from a venereal affection; and it ſeems not only to act as a mercurial, but alſo, by the ſevere vomiting it occaſions, to perform the office of a diſcutient, by accelerating the motion of the blood in the parts affected. It is ſaid likewiſe to have been employed with ſucceſs, in robuſt conſtitutions, againſt leprous diſorders, and obſtinate glandular obſtructions: the doſe is from two grains to ſix or eight. It may be given in doſes of a grain or two as an alterative and diaphoretic. Dr. Hope, ſenior, has found, that in doſes of one grain, with a little powder of liquorice root, it forms a very convenient errhine.

This medicine was lately recommended as the moſt effectual preſervative againſt the hydrophobia.

On the whole, however, we conſider it as a ſuperfluous preparation, whoſe place may be more ſafely ſupplied by other mercurials or emetics.

SULPHURETUM HYDRARGYRI NIGRUM; olim, ÆTHIOPS MINERALIS. *Edin.* HYDRARGYRUS CUM SULPHURE, *Lond.* HYDRARGYRUM SULPHURATUM NIGRUM. *Dub.*

Black Sulphuret of Quickſilver, formerly *Æthiops Mineral.*

Take of
  Purified quickſilver,
  Sublimed ſulphur, each equal weights.
Grind them together in a glaſs mortar with a glaſs peſtle, till the mercurial globules totally diſappear.
(It is alſo prepared with twice the quantity of quickſilver. *Ed.*)

THIS proceſs, ſimple as it appears, is not, even in the preſent advanced ſtate of chemiſtry, perfectly underſtood. It was formerly imagined, that the quickſilver was merely mechanically divided, and intimately mixed with the ſulphur. But that they are really chemically united, is indiſputably proved by the inſolubility of the compound in nitrous acid. Fourcroy is of opinion, that during the trituration, the mercury abſorbs oxygen, and is converted into the black oxide, and that in this ſtate it is ſlightly combined with the ſulphur. The editors of Gren alſo ſuppoſe it to be in the ſtate of black oxide, but that it is combined with hydroguretted ſulphur; and they direct a little water to be added during the trituration, that by its decompoſition it may facilitate the proceſs.

The black ſulphuret of quickſilver, thus prepared by trituration, has a pulverulent form, is inſoluble in nitric acid, is totally ſoluble in a ſolution of potaſs, and is precipitated unchanged from this ſolution, by acids. It is not altered by expoſure to the air; and when heated in an open veſſel, it emits ſulphureous acid gas, acquires a dark violet colour, and, laſtly, ſublimes in a brilliant red maſs, compoſed of cryſtalline needles.

The combination of quickſilver with ſulphur may be much more ſpeedily affected by the aſſiſtance of heat, by pouring the mercury, previouſly heated, upon the ſulphur in a ſtate of fuſion, and ſtirring them until they cool, and form a conſiſtent maſs, which may be afterwards powdered. The ſulphuret prepared by fuſion, differs, however, from that prepared by trituration; for it is not ſoluble in a ſolution of potaſs, but is converted by long ebullition in it into the red ſulphuret, and it alſo reddens ſpontaneouſly in courſe of time from the action of the air.

Black ſulphuret of mercury may be alſo prepared in the humid way, as it is called, by precipitation, or even by direct ſolution. According to Berthollet, mercury agitated with ſulphuretted hydroguret of ammonia, forms a black ſulphuret exactly reſembling that prepared by trituration; but if hydroguretted ſulphuret of ammonia be uſed, the black precipitate formed gradually aſſumes a red colour, and the ſolution contains ſulphuretted hydroguret of ammonia. The ſame phenomena take place with all the mercurial ſalts.

As a medicine, black ſulphuret of quickſilver poſſeſſes no very conſpicuous effects. It is principally uſed as an alterative in glandular affections, and in cutaneous diſeaſes. It has been commonly given in doſes of from 5 to 10 grains; but even in doſes of ſeveral drachms, and continued for a conſiderable length of time, it has ſcarcely produced any ſenſible effect.

HYDRARGYRUM SULPHURATUM RUBRUM; olim, CINNABARIS FACTITIA. *Lond. Dub.*

Red Sulphuretted Quickſilver, formerly *Factitious Cinnabar.*

Take of
Quickſilver purified, forty ounces;
Sulphur, eight ounces.

Mix the quickſilver with the melted ſulphur; and if the mixture takes fire, extinguiſh it by covering the veſſel; afterwards reduce the maſs to powder and ſublime it.

As ſoon as the mercury and ſulphur begin to unite, a conſiderable exploſion frequently happens, and the mixture is very apt to take fire, eſpecially if the proceſs be ſomewhat haſtily conducted. This accident the operator will have previous notice of, from the matter ſwelling up, and growing ſuddenly conſiſtent; as ſoon as this happens, the veſſel muſt be immediately cloſe covered.

During the ſublimation, care muſt be had that the matter do not riſe into the neck of the veſſel, ſo as to block up and burſt the glaſs. To prevent this, a wide-necked bolt head, or rather an oval earthen jar, coated, ſhould be choſen for the ſubliming veſſel. If the former be employed, it will be convenient to introduce at times an iron wire, ſomewhat heated, in order to be the better aſſured that the paſſage is not blocking up; the danger of which may be prevented by cautiouſly raiſing the veſſel higher from the fire.

If the ingredients be pure, there is no reſiduum. In ſuch caſes, the ſublimation may be known to be over, by introducing a wire as before, and feeling with it the bottom of the veſſel, which will then be perfectly ſmooth: if any roughneſs or inequalities be perceived, either the mixture was impure, or the ſublimation is not completed; if the latter be the caſe, the wire will ſoon be covered over with the riſing cinnabar.

The preparers of cinnabar in large quantities, employ earthen jars, which in ſhape pretty much reſemble an egg. Theſe are of different ſizes, according to the quantity intended to be made at one ſublimation, which ſometimes amounts to two hundred-weight. The jar is uſually coated from the ſmall end almoſt to the middle, to prevent its breaking from the vehemence or irregularity of the fire. The greater part, which is placed uppermoſt, not being received within the furnace, has no occaſion for this defence. The whole ſecret, with regard to this proceſs, is the management of the fire, which ſhould be ſo ſtrong as to keep the matter continually ſubliming to the upper part of the jar, without coming out at its mouth, which is covered with an iron plate. Care ſhould alſo be taken to put into the ſubliming veſſel only ſmall quantities of the mixture at a time.

When taken out of the ſubliming veſſels, the red ſulphuret of quickſilver is a brilliant cryſtalline maſs, and firſt acquires its very rich colour when reduced to the form of a fine powder by trituration. It has neither ſmell nor taſte, and is inſoluble in water and in alcohol. In cloſe veſſels it ſublimes entirely unchanged, but requires for this purpoſe a pretty great degree of heat. It is not ſoluble in any acid, and is only decompoſed by the nitro-muriatic, which diſſolves the quickſilver, and ſeparates the ſulphur. It is not decompoſed by boiling it with ſolutions of the alkalies, but is decompoſed by melting it with potaſs, ſoda, lime, iron, lead, copper, antimony, and ſeveral other metals. Prouſt has proved it to conſiſt of 85 quickſilver, and 14 or 14½ ſulphur, and that the quickſilver is not oxidized to a maximum, as had been falſely ſuppoſed, but in its metallic ſtate. His analyſis is confirmed by the other methods by which cinnabar may be prepared. Thus, the black ſulphuret of quickſilver by fuſion is converted into the red ſulphuret, by boiling it in a ſolution of potaſs, which can only act by diſſolving the ſulphuretted hydrogen and ſuperfluous ſulphur. Sub-muriate, or ſub-ſulphate of mercury, ſublimed with ſulphur, furniſh red ſulphuret of mercury, and muriate, or ſulphate, of mercury.

Med. uſe.—Red ſulphuret of quickſilver is ſometimes uſed in fumigations againſt venereal ulcers in the noſe, mouth, and throat. Half a drachm of it burnt, the fume being imbibed with the breath, has occaſioned a violent ſalivation. This effect is by no means owing to the medicine as a ſulphuret; for when ſet on fire, it is no longer ſuch, but mercury reſolved into vapour, and blended with the ſulphureous acid gas; in which circumſtances, this mineral has very powerful effect.

Mr. Pearſon, from his experiments on mercurial fumigation, concludes, that where checking the progreſs of the diſeaſe ſuddenly is an object of great moment, and where the body is covered with ulcers or large and numerous eruptions, and, in general, to ulcers, fungi, and excreſcences, the vapour of mercury is an application of great efficacy and utility; but that it is apt to induce a ptyaliſm rapidly, and great conſequent debility, and that for the purpoſe of ſecuring the conſtitution againſt a relapſe, as great a quantity of mercury muſt be introduced into the ſyſtem, by inunction, as if no fumigation had been employed.

CHAP. X.

LEAD.

ACETIS PLUMBI; olim, SACCHARUM SATURNI. *Edin.*

Acetite of Lead; formerly *Sugar of Lead.*

Take of
 White oxide of lead, any quantity;
Put it into a cucurbit, and pour upon it of
 Diſtilled acetous acid ten times its weight.

Let the mixture ſtand upon warm ſand till the acid become ſweet; when it is to be poured off, and freſh acid added until it ceaſe to become ſweet. Then evaporate all the liquor, freed from impurities, in a glaſs veſſel, to the conſiſtence of thin honey, and ſet it aſide in a cold place, that cryſtals may be formed, which are to be dried in the ſhade. The remaining liquor is again to be evaporated, that new cryſtals may be formed; and the evaporation is to be repeated until no more cryſtals concrete.

CERUSSA ACETATA. *Lond.*
Acetated Ceruſe.

Take of
 Ceruſe, one pound;
 Diſtilled vinegar, one gallon and a half.

Boil the ceruſe with the vinegar until the vinegar is ſaturated; then filter through paper; and, after proper evaporation, ſet it aſide to cryſtallize.

Dub.

Take of
 Ceruſe, any quantity;
 Diſtilled vinegar, ten times as much.

Digeſt in a glaſs veſſel, until the vinegar become ſweet. Having poured this off, add more vinegar, until it ceaſe to become ſweet. Filter the liquor, and evaporate it ſlowly, ſo that it may form cryſtals, which are to be dried in the ſhade.

THE acetate of lead is ſeldom prepared by the apothecary, as he can procure it at an infinitely cheaper rate from thoſe who manufacture it in large quantities. The preparation of it, as directed by the colleges, is a caſe of ſimple ſolution. The proceſs frequently fails, from the oxide of lead employed being adulterated with carbonate of lime, or ſome other earthy ſubſtance. The acetic acid employed, ſhould be as ſtrong as can be procured; for with a weak acid the product of pure ſalt is ſmall, and the quantity of mother-water is increaſed. The addition of a ſmall quantity of alcohol to the ſolution, after it has been duly evaporated, is ſaid to improve the beauty of the cryſtals. The mother-water may alſo be made to furniſh pure cryſtals, by adding to it a freſh portion of acetic acid; for without that precaution it furniſhes only a very heavy, yellow, pulverulent, maſs, in which there ſeems to be an exceſs of oxide of lead.

The manufacture of acetate of lead is conducted more economically when the oxide is diſſolved in the acid at the ſame time that it is prepared; which is done by alternately expoſing plates of lead to the vapour of acetic acid, and immerſing the plates, thus covered with oxide, into the acid itſelf.

Acetate of lead has a ſweet ſtypic taſte. It has a white colour, and cryſtallizes in flat parallelopipeds, terminated by a wedge, or more commonly in ſhining needles. It is ſoluble in water, and in alcohol; effloreſces ſlightly in the air, and is decompoſed by heat and light. It is alſo decompoſed by the alkalies, and moſt of the earths and acids. The proportions of its conſtituents have not been aſcertained.

Medical uſe.—The internal uſe of acetate of lead, notwithſtanding the encomiums ſome have been raſh enough to beſtow upon it, is entirely to be rejected. It forms, however, a very valuable external application in ſuperficial and phlegmonic inflammations, bruiſes, and diſeaſes of the ſkin. It is always applied in ſolution, either ſimply, as to the eyes, or by means of cloths ſoaked in it, or mixed with bread-crumb. A drachm, with five ounces of any diſtilled water, forms a ſtrong ſolution, and with ten ounces of water, a weak ſolution. If common water be uſed, the addition of about a drachm of acetous acid will be neceſſary to keep the lead in ſolution.

Off. prep.—Acid. acetoſ. forte, *Ed.* Solutio acet. zinci, *Ed.* Ungt. acet. zinci, *Ed. Lond. Dub.*

AQUA LITHARGYRI ACETATI. *Lond.* LIQUOR LITH. ACET.; olim, EXTRACTUM SATURNI. *Dub.*

Water of Acetated Litharge, formerly *Extract of Lead.*

Take of
- Litharge, two pounds and four ounces;
- Diſtilled vinegar, one gallon.

Mix, and boil to ſix pints, conſtantly ſtirring; then ſet it aſide. After the feces have ſubſided, ſtrain.

Off. prep.—Ceratum lith. acet. *Lond. Dub.*

LIQUOR LITHARGYRI ACETATI COMPOSITUS. *Dub.* AQUA LITH. ACET. COMPOSITA. *Lond.*

Compound Liquor of Acetated Litharge.

Take of
- Liquor of acetated litharge, a drachm;
- Diſtilled water, fourteen ounces, (one pint, *Lond.*);
- Weaker ſpirit of wine, a drachm.

Mix the ſpirit and liquor of acetated litharge, then add the diſtilled water.

THESE preparations do not differ from ſolutions of the ſame ſtrength of acetate of lead, and are leſs proper, as their ſtrength is apt to vary. The vitrified oxide of lead made uſe of in this inſtance, is leſs eaſily ſoluble, on account of its great force of aggregation, than the white oxide; but, on the other hand, it is leſs liable to be adulterated. The addition of the diluted alcohol to the weak ſolution, is intended to prevent its decompoſition, but it alſo renders it ſlightly ſtimulant.

CHAP. XI.

TIN.

STANNI PULVIS. *Lond.*

Powder of Tin.

Take of
Tin, four ounces,
Melt it, and take off the ſcoriæ. Then pour it into a clean iron veſſel. Reduce it to powder, either by agitation or trituration; and paſs the fine part of the powder through a hair ſieve.

Dub.

Take of
Tin, any quantity.
Having melted it over the fire, agitate it, while it is cooling, with an iron ſpatula, until it be reduced to powder; which is to be paſſed when cold through a ſieve.

The College of Edinburgh do not give this preparation, inſerting *Limatura et Pulvis Stanni* in their liſt of the materia medica.

Medical uſe.—It is often employed as a remedy againſt worms, particularly the flat kinds, which too often elude the force of other medicines. The general doſe is from a ſcruple to a drachm; ſome confine it to a few grains. But Dr. Alſton aſſures us, in the Edinburgh Eſſays, that its ſucceſs chiefly depends on its being given in much larger quantities. He directs an ounce of the powder on an empty ſtomach, mixed with four ounces of molaſſes; next day, half an ounce; and the day following, half an ounce more; after which, a carthartic is adminiſtered. He ſays the worms are uſually voided during the operation of the purge, but that pains of the ſtomach occaſioned by them are removed almoſt immediately upon taking the firſt doſe of the tin. This practice is ſometimes ſucceſsful in the expulſion of tæniæ, but by no means ſo frequently as Dr. Alſton's obſervations would lead us to hope.

Blaine's powder, which certainly ſucceeds ſometimes in curing the diſtemper in dogs, ſeems to be a ſulphuretted oxide of tin.

CHAP. XII.

ZINC.

OXIDUM ZINCI. *Edin.*
Oxide of Zinc.

Let a large crucible be placed in a furnace filled with live coals, ſo as to be ſomewhat inclined towards its mouth; and when the bottom of the crucible is moderately red, throw into it a ſmall piece of zinc, about the weight of a drachm. The zinc ſoon inflames, and is at the ſame time converted into white flakes, which are to be from time to time removed from the ſurface of the metal with an iron ſpatula, that the combuſtion may be more complete; and at laſt, when the zinc ceaſes to flame, the oxide of zinc is to be taken out of the crucible. Having put in another piece of zinc, the operation is to be repeated, and may be repeated as often as is neceſſary. Laſtly, the oxide of zinc is to be prepared in the ſame way as the carbonate of lime.

ZINCUM CALCINATUM. *Lond.*
Calcined Zinc.

Take of
Zinc, broken into pieces, eight ounces.

Throw the zinc at ſeveral times into an ignited, large, deep, and inclined, crucible; placing over it another crucible, in ſuch a manner that the air may have free acceſs to the burning zinc. Take out the calx as ſoon as it appears, and paſs its white and lighter part through a ſieve.

CALX ZINCI; olim, FLORES ZINCI. *Dub.*
Calx of Zinc, formerly *Flowers of Zinc.*

Take of
Zinc, broken into pieces, any quantity.

Throw it, at different times, into a ſufficiently deep crucible, heated red-hot, and placed with its mouth inclined towards the mouth of the furnace. After each time any zinc is thrown in, cover the crucible with another inverted over it, but ſo that the air may have acceſs to the zinc. Preſerve the white and very light calx for uſe.

This is an inſtance of ſimple oxidizement. At a red heat, zinc attracts the oxygen of the atmoſphere ſo ſtrongly, that it is quickly covered with a cruſt of white oxide, which prevents the air from acting on the metal below; and therefore we are deſired to operate only on ſmall pieces at a time, and to place the crucible ſo that we may eaſily take out the oxide formed, and introduce freſh pieces of zinc. As ſoon as the cruſt of oxide is broken or removed the zinc inflames, and burns with a brilliant white or greeniſh, blue flame, being at the ſame time converted into very light white flocculi. To ſave theſe as much as poſſible, we are directed to uſe a very deep and large crucible, and to cover it with an inverted crucible. But as we muſt not cover it ſo as to prevent the acceſs of the air, it is doubtful whether the latter precaution be of much ſervice. The greater part of the zinc is, however, oxidized in the crucible, without being previouſly converted into vapour; and as this portion of the oxide is always mixed with particles of zinc, it is neceſſary to ſeparate them by trituration and elutriation.

The oxide thus obtained is of a pure white colour, without ſmell or taſte, infuſible and fixed in the fire, inſoluble in water or alcohol, and entirely ſoluble in acids. The preſence of lead in it is detected by ſulphuric acid, which forms in that caſe an inſoluble ſulphate of lead. The white oxide of zinc contains 82.15 zinc, and 17.85 oxygen.

Medical uſe.—White oxide of zinc is applied externally as a detergent and exſiccant remedy. With twice its weight of axunge, it forms an excellent application to deep chops, or excoriated nipples. But beſides being applied externally, it has alſo of late been uſed internally. In doſes from one to ſeven or eight grains, it has been much celebrated in the cure of epilepſy and ſeveral ſpaſmodic affections: and there are ſufficient teſtimonies of their good effects, where tonic remedies in thoſe affections are proper.

Off. prep.—Ungt. oxidi zinci, *Ed.*

CARBONAS ZINCI IMPURUS PRÆPARATUS; olim, Lapis Calaminaris Præparatus. *Edin.*

Prepared Impure Carbonate of Zinc, formerly *Prepared Calamine.*

The impure carbonate of zinc, after being roaſted by thoſe who make braſs, is prepared in the ſame way as carbonate of lime.

Lapis Calaminaris Præparatus. *Dub.*

Prepared Calamine.

Reduce calcined calamine to powder, and ſeparate the impalpable parts in the ſame manner that is directed in the preparation of crabs claws.

Lond.

See the preparation of ſubſtances inſoluble in water.

As this oxide of zinc is intended for external application, and often to parts very eaſily irritated, too much pains cannot be beſtowed in reducing it to a fine powder.

OXIDUM ZINCI IMPURUM PRÆPARATUM; olim, TUTIA PRÆPARATA. *Edin.*

Prepared Impure Oxide of Zinc, formerly *Prepared Tutty.*

It is prepared as carbonate of lime.

TUTIA PRÆPARATA. *Lond.*

Prepared Tutty.

See the preparation of ſubſtances inſoluble in water.

THIS oxide is alſo prepared for external uſe only.

SULPHAS ZINCI. *Ed.*

Sulphate of Zinc.

Take of
Zinc, cut into ſmall pieces, three ounces;
Sulphuric acid, five ounces.
Water, twenty ounces.

Mix them, and when the efferveſcence is finiſhed, digeſt the mixture for a little on hot ſand; then ſtrain the decanted liquor through paper, and after proper evaporation ſet it apart, that it may cryſtallize.

ZINCUM VITRIOLATUM. *Lond. Dub.*

Vitriolated Zinc.

Take of
White vitriol, one pound;
Vitriolic acid, one drachm;
Boiling diſtilled water, three pints.

Mix and filter through paper. After proper evaporation, ſet it aſide in a cold place to cryſtallize.

THE ſulphate of zinc of commerce is never pure, but always contains iron, copper, and a little lead. From the mode of its preparation, there is alſo a deficiency of acid and water of cryſtallization. The means directed for purifying it by the London and Dublin colleges will ſupply theſe, but do not ſeparate the foreign metals, except perhaps the lead. If, therefore, a pure ſulphate of zinc be wanted, we may, according to the directions of the Edinburgh college, diſſolve pure zinc in pure ſulphuric acid; but we believe this proceſs is very rarely practiſed, eſpecially as the common ſulphate of zinc may be ſufficiently purified by expoſing it in ſolution to the air, by which means red oxide of iron is precipitated, and by digeſting it upon pure zinc, which precipitates the other metals.

Sulphate of zinc cryſtallizes in tetrahedral priſms terminated by pyramids. It has a metallic ſtyptic taſte; effloreſces ſlowly when expoſed to the air. It is ſoluble in 2.5 parts of water at 60°, and in much leſs boiling water. It is not ſoluble in alcohol. It is decompoſed by the alkalies and earths, hydroguretted ſulphurets, and ſulphuretted hydrogurets. It conſiſts of 20 oxide of zinc, 40 acid, and 40 water of cryſtallization.

Medical uſe.—Sulphate of zinc, in doſes from ten grains to half a drachm, operates almoſt inſtantly as an emetic, and is at the ſame time perfectly ſafe. It is therefore given, when immediate vomiting is required, as in caſes where poiſon has been ſwallowed. By employing it internally, in ſmaller doſes, it acts as a tonic; and ſome think it in every caſe preferable to the oxide of zinc.

Externally, it is uſed as a ſtyptic application to ſtop hæmorrhagies; diminiſh increaſed diſcharges, as gonorrhœa; and to cure external inflammations ariſing from debility and relaxation of the blood-veſſels, as in ſome caſes of ophthalmia.

Off. prep.—Solutio ſulphat. zinci, *Ed.* Aqua zinci vitriol cum camph. *Lond.* Aqua alum. comp. *Lond.* Solutio acet. zinci, *Ed.*

SOLUTIO SULPHATIS ZINCI. *Ed.*

Solution of Sulphate of Zinc.

Take of
Sulphate of zinc, ſixteen grains;
Water, eight ounces;
Diluted ſulphuric acid, ſixteen drops.

Diſſolve the ſulphate of zinc in the water; then, having added the acid, filter through paper.

The acid is here added to diſſolve the exceſs of oxide of zinc, which the common ſulphate often contains. This ſolution is of a ſtrength proper for injecting into the urethra in gonorrhœa, or applying to the eyes in chronic ophthalmia.

AQUA ZINCI VITRIOLATI cum CAMPHORA. *Lond.*

Water of Vitriolated Zinc with Camphor.

Take of
  Vitriolated zinc, half an ounce;
  Camphorated ſpirit, half an ounce, by meaſure;
  Boiling water, two pints.
Mix and filter through paper.

It is uſed externally as a lotion for ſome ulcers, particularly thoſe in which it is neceſſary to reſtrain a great diſcharge. It is alſo not unfrequently employed as a collyrium in ſome caſes of ophthalmia, where a large diſcharge of watery fluid takes place from the eyes with but little inflammation; but when it is to be applied to this tender organ, it ought firſt, at leaſt, to be diluted by the addition of more water.

AQUA ALUMINIS COMPOSITA. *Lond.*

Compound Alum Water.

Take of
  Alum,
  Vitriolated zinc, of each half an ounce;
  Boiling diſtilled water, two pints.
Pour the water on the ſalts in a glaſs veſſel, and ſtrain.

This water was long known in our ſhops, under the title of *Aqua aluminoſa Bateana.*

It is uſed for cleanſing and healing ulcers and wounds; and for removing cutaneous eruptions, the part being bathed with it hot three or four times a-day. It is ſometimes likewiſe employed as a collyrium; and as an injection in gonorrhœa and fluor albus, when not accompanied with virulence.

SOLUTIO ACETITIS ZINCI. *Ed.*

Solution of Acetite of Zinc.

Take of
  Sulphate of zinc, a drachm;
  Diſtilled water, ten ounces.
Diſſolve.

Take of
  Acetite of lead, four ſcruples;
  Diſtilled water, ten ounces.
Diſſolve.
Mix the ſolutions; let them ſtand at reſt a little, and then filter the liquor.

This is a caſe of double elective attraction, the lead combining and forming an inſoluble compound with the ſulphuric acid, while the zinc unites with the acetic acid, and remains in ſolution.

The acetate of zinc may be obtained by evaporation in talcy cryſtals. It is ſoluble in water, and is decompoſed by heat. It is not poiſonous.

When cryſtallized acetate of lead and ſulphate of zinc are triturated together, the mixture preſently becomes moiſt, which is owing to the new compounds combining with leſs water of cryſtallization than the original ſalts, by which means a portion of the water is diſengaged in its fluid form.

Med. uſe.—The ſolution of acetate of zinc is with many practitioners deſervedly much eſteemed as an aſtringent collyrium, and injection.

CHAP. XIII.

ALCOHOL, ETHER, and ETHEREAL SPIRITS.

ALCOHOL. *Lond.*

Alcohol.

Take of
Rectified ſpirit of wine, one gallon;
Prepared kali, made hot, one pound and a half;
Pure kali, one ounce.

Mix the vinous ſpirit with the pure kali, and afterwards add one pound of the hot prepared kali; ſhake them, and digeſt for twenty-four hours. Pour off the ſpirit, to which add the reſt of the prepared kali, and diſtil in a water bath. It is to be kept in a veſſel well ſtopped. The kali ſhould be heated to 300° Fahrenheit.

The ſpecific gravity of alcohol is to that of diſtilled water as 815 to 1000.

Dub.

Take of
Rectified ſpirit of wine, five pounds;
Pearl-aſhes, dried over the fire, and ſtill warm, one pound;

Cauſtic vegetable alkali, in powder, one ounce.

Mix the ſpirit and the cauſtic alkali; add the pearl-aſhes, previouſly reduced to powder, and digeſt the mixture for three days, frequently agitating it; then pour off the ſpirit, and diſtil over three pounds with a moderate heat.

The ſpecific gravity of this ſpirit is to that of diſtilled water as 820 to 1000.

The theory of theſe proceſſes has been already explained, and alſo the ſuperiority of muriate of lime over carbonate of potaſs for ſeparating the laſt portions of water from alcohol. The potaſs is uſed by the London and Dublin colleges in ſuch ſmall quantity that it can have little effect; when added in conſiderable quantity, it acts upon the alcohol itſelf, and decompoſes it, converting it into an ethereal liquor. The Edinburgh college give no directions for the preparation of a perfectly pure alcohol, as it is never uſed in pharmacy; but it is perhaps to be regretted, that they have given the title of alcohol to a liquid which is not the alcohol of chemiſts.

ÆTHER SULPHURICUS. *Ed.*

Sulphuric Ether.

Take of
Sulphuric acid,
Alcohol, each thirty-two ounces.

Pour the alcohol into a glaſs retort fit for ſuſtaining a ſudden heat, and add to it the acid in an uninterrupted ſtream. Mix them by degrees, ſhaking them moderately and frequently; this done, inſtantly diſtil from ſand previouſly heated for the purpoſe, into a receiver kept cool with water or ſnow. But the heat is to be ſo managed, that the liquor ſhall boil as ſoon as poſſible, and continue to boil till ſixteen ounces are drawn off; then let the retort be removed from the ſand.

To the diſtilled liquor add two drachms of potaſs; then diſtil from a very high retort, with a very gentle heat, into a cool receiver, until ten ounces have been drawn off.

If ſixteen ounces of alcohol be poured upon the acid remaining in the retort after the firſt diſtillation, and the diſtillation be repeated, more ether will be obtained; and this may be repeated ſeveral times.

Æther Vitriolicus. *Lond.*

Vitriolic Ether.

Take of
The ſpirit of vitriolic ether, two pounds by weight;

Water of pure kali, one ounce by meaſure.

Shake them together, and diſtil, with a gentle heat, fourteen ounces by meaſure.

ÆTHER VITRIOLICUS. *Dub.*

Vitriolic Ether.

Take of

Vitriolic ethereal liquor, fixteen ounces;

Cauſtic vegetable alkali, in powder, two drachms.

Mix them, and diſtil with a gentle heat ten ounces from a very high retort into a cooled receiver.

ÆTHER SULPHURICUS CUM ALCOHOLE. *Ed.*

Sulphuric Ether with Alcohol.

Take of

Sulphuric ether, one part;

Alcohol, two parts.

Mix them.

SPIRITUS ÆTHERIS VITRIOLICI. *Lond.*

Spirit of Vitriolic Ether.

Take of

Rectified ſpirit of wine,

Vitriolic acid, each one pound.

Pour the acid gradually upon the ſpirit, and mix them by ſhaking; then diſtil with a gentle heat, from a retort into a tubulated receiver, to which another recipient is fitted, the ſpirit of vitriolic ether, till ſulphureous vapours begin to riſe.

If you apply another receiver, and continue the diſtillation, a little oil of wine will be obtained, which is to be preſerved for uſe.

LIQUOR ÆTHEREUS VITRIOLICUS. *Dub.*

Vitriolic Ethereal Liquor.

Take of

Rectified ſpirit of wine,

Sulphuric acid, each thirty-two ounces.

Put the ſpirit into a glaſs retort, capable of ſupporting a ſudden heat, and pour upon it the acid in a continued ſtream. Mix them gradually, and having placed the retort in ſand previouſly heated, diſtil the liquor into a cool receiver. But the heat is to be ſo regulated, that the mixture may boil as ſoon as poſſible; and the retort is to be removed from the ſand when ſixteen ounces have come over.

Off. prep.—Tinct. aloes æther, *Ed.* Æth. ſulph. cum alc. aromaticus, *Ed.*

OLEUM VINI. *Lond.*
Oil of Wine.

Take of
Alcohol,
Vitriolic acid, of each one pint.

Mix them by degrees, and diſtil; taking care that no black froth paſs into the receiver. Separate the oily part of the diſtilled liquor from the volatile vitriolic acid. To the oily part add as much water of pure kali as is ſufficient to correct the ſulphureous ſmell; then diſtil off the little ether with a gentle heat. The oil of wine will remain in the retort, ſwimming on the watery liquor; from which it is to be ſeparated.

SPIRITUS ÆTHERIS VITRIOLICI COMPOSITUS. *Lond.*
Compound Spirit of Vitriolic Ether.

Take of
Spirit of vitriolic ether, two pounds;
Oil of wine, three drachms.

Mix them.

LIQUOR ÆTHEREUS OLEOSUS; olim, LIQUOR HOFFMANNI ANODYNUS. *Dub.*
Oily Ethereal Liquor, formerly *Anodyne Liquor of Hoffman.*

Take what remains in the retort after the diſtillation of the vitriolic ether.

Diſtil to one half with a moderate heat.

THE products ariſing from the decompoſition of alcohol by the action of the acids are extremely curious and intereſting. The theory of their formation was not underſtood until lately, when it was very ingeniouſly attempted by Fourcroy and Vauquelin, who endeavour to ſhew that the acid remains unchanged, and that the alcohol is converted into ether, water, and charcoal.

The moſt convenient way of mixing the ingredients is to put the alcohol into a tubulated retort, and, with a long tubed funnel reaching down to the bottom of the retort, to pour in the acid. By cautious agitation the two fluids unite, and heat is produced, which may be taken advantage of in the diſtillation, if we have a ſand bath previouſly heated to the ſame degree, to ſet the retort into immediately after the mixture is completed; nor is there any occaſion for a tubulated receiver, if we immerſe the ordinary receiver, which ought to be large, in water, or bury it in broken ice.

The diſtillation ſhould be performed with an equal and very gentle heat. The juncture of the retort and recipient is to be luted with a paſte made of linſeed meal, and further ſecured by a piece of wet bladder.

Immediately on mixing the acid with the alcohol, there is a conſiderable increaſe of temperature, and a ſlight diſengagement of alcohol, ſomewhat altered, and having an aromatic odour. On placing the retort in the ſand bath, a portion of pure alcohol firſt comes over; and when the mixture in the retort boils, the ether riſes, and is condenſed in thin, broad, ſtraight, ſtreaks, having the appearance of oil. Until the liquor which paſſes over into the receiver amounts to about half, or ſomewhat more than half, of the alcohol operated on, it conſiſts almoſt entirely of alcohol and ether, and there has been no production of any permanently elaſtic fluid: but now the product of ether ceaſes; the ſulphuric acid is decompoſed; and ſulphureous vapours begin to ariſe, which condenſe in irregular ſtreaks, or in drops: we muſt therefore either put a ſtop to the proceſs, or change the receiver. In the latter caſe the products, are ſulphureous acid, acetic acid, water, and oil of wine, as it was called, accompanied towards the end by a peculiar ſpecies of carburetted hydrogen gas, called by the Dutch chemiſts Oleſiant gas; becauſe, when mixed with oxygenized muriatic acid, it forms oil. At laſt the matter in the retort, which has now become thick and black, ſwells up, and prevents us from carrying the proceſs further.

If we ſtop the proceſs before the ſulphureous vapours ariſe, the whole acid, diluted with a proportion of water, and mixed with charcoal, remains in the retort; but if we allow the proceſs to go on, there is a continual decompoſition of the acid, which is therefore diminiſhed in quantity. In either caſe, according to Prouſt, the ſulphuric acid may be obtained from the black reſiduum in the retort, by diluting it with twice its weight of water, filtering it through linen, and evaporating it till it acquire the ſpecific gravity 1.84, then adding about one five-hundredth part of nitrate of potaſs, and continuing the evaporation until the acid become perfectly colourleſs, and acquire the ſpecific gravity of 1.86. The reſiduum, however, may be more advantageouſly preſerved, as the Edinburgh college direct, for preparing more ether, by repeating the proceſs with freſh quantities of alcohol. Prouſt indeed denies that this reſiduum is capable of converting more alcohol into ether; but that excellent chemiſt has ſomehow fallen into error, for it is a fact, that was known in the time of that no leſs excellent chemiſt Dr. Lewis, and inſerted in his firſt edition of this diſpenſatory, publiſhed in 1753, and not a recent diſcovery of Citizen Cadet, as

Fourcroy would lead us to believe. If farther confirmation be wanted, we ſhall inſtance Göttling, who ſays, that from three or four pounds of this reſiduum, he has prepared 60 or 70 pounds of the ſpirit of vitriolic ether, and more than twelve pounds of vitriolic ether, without rectifying the reſiduum, or allowing the ſulphureous vapour to evaporate. The ether may be ſeparated from the alcohol and ſulphureous acid, with which it is always mixed, by re-diſtilling it with a very gentle heat, after mixing it with potaſs, or rather lime, which combine with the acid, or with black oxide of manganeſe, which converts the ſulphureous into ſulphuric acid, and thus deprives it of its volatility.

Med. uſe.—The chemical properties of ether have been already noticed. As a medicine taken internally, it is an excellent antiſpaſmodic, cordial, and ſtimulant. In catarrhal and aſthmatic complaints, its vapour is inhaled with advantage, by holding in the mouth a piece of ſugar on which ether has been dropt. It is given as a cordial in nauſea, and in febrile diſeaſes of the typhoid type; as an antiſpaſmodic, in hyſteria, and in other ſpaſmodic and painful diſeaſes; and as a ſtimulus in ſoporoſe and apoplectic affections. Regular practitioners ſeldom give ſo much as half an ounce, much more frequently only a few drops, for a doſe; but empirics have ſometimes ventured upon much larger quantities, and with incredible benefit. When applied externally, it is capable of producing two very oppoſite effects according to its management; for, if it be prevented from evaporating, by covering the place to which it is applied cloſely with the hand, it proves a powerful ſtimulent and rubefacient, and excites a ſenſation of burning heat. In this way it is frequently uſed for removing pains in the head or teeth. On the contrary, if it be dropt on any part of the body, expoſed freely to the contact of the air, its rapid evaporation produces an intenſe degree of cold; and as this is attended with a proportional diminution of bulk in the part applied, in this way it has frequently facilitated the reduction of ſtrangulated hernia.

The mixture of ether with alcohol, whether prepared directly by mixing them as the Edinburgh college direct, or in the impure ſtate in which it comes over in the firſt part of the proceſs for diſtilling ether, the ſpirit of vitriolic ether of the London, and the vitriolic ethereal liquor of the Dublin, colleges, poſſeſſes ſimilar virtues with ether, but in an inferior degree.

SPIRITUS ÆTHERIS NITROSI. *Ed.* LIQUOR ÆTHEREUS NITROSUS. *Dub.*

Spirit of Nitrous Ether. Nitrous Ethereal Liquor.

Take of

Alcohol, three pounds;

Nitrous acid, one pound.

Pour the alcohol into a capacious phial, placed in a veſſel full of cold water, and add the acid by degrees, conſtantly agitating them. Let the phial be ſlightly covered, and placed for ſeven days in a cool place; then diſtil the liquor with the heat of boiling water into a receiver kept cool with water or ſnow, till no more ſpirit comes over.

SPIRITUS ÆTHERIS NITROSI. *Lond.*
Spirit of Nitrous Ether.

Take of

Rectified ſpirit of wine, two pints;

Nitrous acid, half a pound.

Mix them, by pouring in the acid to the ſpirit, and diſtil with a gentle heat one pound ten ounces.

THE action of alcohol and nitrous acid upon each other is much influenced by their proportions. If we uſe a ſmall proportion of alcohol, or pour alcohol into nitrous acid, there immediately takes place a great increaſe of temperature, and a violent effervescence and diſengagement of red fumes. On the contrary, by placing the phials containing the alcohol and acid, in cold, or rather iced water, they may be mixed, without danger, in the proportions directed by the colleges, and if the acid be added in ſmall quantities at a time, and each portion thoroughly mixed with the alcohol by agitation, I find that no action takes place until heat be applied. It is therefore unneceſſary to keep the mixture for ſeven days, but we may immediately proceed to the diſtillation, which muſt be performed with a very ſlow and well regulated fire; for the vapour is very apt to expand with ſo much violence as to burſt the veſſels; and the heat muſt at no time exceed 212°, otherwiſe a portion of undecompoſed acid will paſs over and ſpoil the product. By performing this operation carefully in a Woulfe's apparatus I got from three ounces of alcohol, ſpecific gravity 841, and one ounce of nitrous acid, two ounces four drachms of ſpirit of nitrous ether, ſpecific gravity 887. Eight ounces of alcohol, contained in the firſt phial, gained one drachm and a half, and ſpecific gravity 873, and eight ounces of water in the ſecond, 18 grains: the reſiduum weighed ſeven drachms and a half. There was therefore a loſs of two drachms forty-two grains of permanently elaſtic fluids. The firſt portion that was examined ſeemed to be the air of the apparatus: in the next the candle burnt with an enlarged and brightened flame; was it nitrous oxide? and all that paſſed afterwards was a mixture of carbonic acid and the etherized nitrous gas firſt deſcribed by the Dutch chemiſts. When recently prepared this gas is inflammable, and does not form red fumes, when atmoſpheric air is admitted to it: but when attempted to be kept over water, the water becomes acidulous, the gas is diminiſhed in bulk about two thirds, has loſt its inflammability, and is now converted into red vapour on the admiſſion of atmoſpheric air. It therefore appears to conſiſt of nitric oxide gas, holding ether in chemical ſolution. I have formed a ſimilar gas, by admitting a few drops of ether to nitric oxide gas over mercury. The Edinburgh and Dublin colleges direct the diſtillation to be continued till no more ſpirit comes over. But how is this to be aſcertained? After having drawn off about two thirds, according to the directions of the London college, I again applied heat to the retort, and examining the air, which began to come over into the pneumatic apparatus, by careleſsly approaching a lighted candle to the extremity of the tube, it kindled and burſt the whole with a violent exploſion.

The ſpirit of nitrous ether thus obtained is a colourleſs fluid, of a fragrant odour, lighter than water, extremely volatile and inflammable, poſſeſſing properties in general analogous to the ſpirit of ſulphuric ether, but of conſiderably greater ſpecific gravity, ſtriking a deep olive, with a ſolution of green ſulphate of iron, and often, if not always, acid. By age and expoſure to the air, it is gradually decompoſed, and gives riſe to the re-production of more nitrous acid. When this change has taken place, it may be rectified by ſaturating the acid with lime-water, and re-diſtilling the ethereal fluid. In all probability it is a mixture of nitrous ether and alcohol; for by diminiſhing the quantity of alcohol employed, we obtain a fluid having a ſimilar relation to the ſpirit of nitrous ether, that ſulphuric ether has to the ſpirit of ſulphuric ether; and by mixing nitrous ether with alcohol, we obtain a fluid exactly reſembling ſpirit of nitrous ether.

When alcohol and nitrous acid are mixed in the proportion neceſſary for the formation of nitrous ether, the utmoſt precautions muſt be taken to diminiſh their action on each other. Dr. Black contrived a very ingenious method of doing this, by rendering their mixture extremely ſlow. On two ounces of the ſtrong acid put into a phial, pour ſlowly and gradually about an equal quantity of water, which, by being made to trickle down the ſides of the phial, will float on the ſurface of the acid without mixing with it; then add, in the ſame cautious manner, three ounces of alcohol, which, in its turn, will float on the ſurface of the water. By this means the three fluids are kept ſeparate on account of their different ſpecific gravities, and a ſtratum of water is interpoſed between the acid and ſpirit. The phial containing the ſpirit muſt be ſtopped with a conical ſtopper, and this ſtopper confined to its place by a weak ſpring. The phial is now to be ſet in a cool place, and the acid will gradually aſcend, and the ſpirit deſcend, through the water, this laſt acting as a boundary to reſtrain their action on each other. When this commences, bubbles of gas riſe through the fluids, and the acid gets a blue colour, which it again loſes in the courſe of a few days, at which time a yellow nitrous ether begins to ſwim on the ſurface. As ſoon as the formation of air-bubbles ceaſes, it is time to remove the ether formed; for if allowed to remain, its quantity decreaſes. By this method a quantity of nitrous ether is formed, without the danger of producing elaſtic vapours or exploſion. The reſiduum of this proceſs is ſtill capable of forming a ſpirit of nitrous ether, with an additional quantity of alcohol.

By adding the acid to the alcohol in very ſmall quantities, and at conſiderable intervals, Mr. Dehne procured from two pounds of alcohol, and one pound ten ounces and three drachms of nitrous acid, one pound, nine ounces and three drachms of ether: the reſiduum weighed one pound twelve ounces. There was therefore a loſs of five ounces. Mr. Dehne put the alcohol into a tubulated retort, to which a receiver was luted, and poured the acid through the tubulature, and the ether paſſed over into the receiver, without the application of any heat. The action of the acid on the alcohol did not begin until ſix ounces and a half were added and was exhauſted, when, on adding more acid, it fell to the bottom in the form of green drops. By uſing Mr. Dehne's precaution, of adding the acid gradually, I prepared nitrous ether in a Woulfe's apparatus, with perfect eaſe and ſafety, although Fourcroy repreſents it as a moſt dangerous operation. I introduced the acid gradually through a funnel luted into the tubulature of the retort. The tube of the funnel was very long, and its extremity was immerſed in the alcohol in the retort. This ſimple contrivance not only enabled me to add the acid as I pleaſed, but alſo acted as a tube of ſafety.

There is ſtill another method of forming nitrous ether, which is indeed ſaid to be preferable to thoſe mentioned. It was firſt practiſed by M. Voigt. Four pounds of dried nitrate of potaſs are to be introduced into a tubulated retort, connected with a Woulfe's apparatus; and a mixture of four pounds of ſulphuric acid, and three pounds four ounces of alcohol, is to be poured upon it. Without the application of any external heat, nitrous ether paſſes over into the receiver, and the reſiduum furniſhes, on more alcohol being added to it, ſpirit of nitrous ether.

When alcohol is converted into ether by the action of nitrous acid, the change produced on it is nearly the ſame with that produced by ſulphuric acid. In the latter caſe, it is effected by the affinities which form water, and charcoal is precipitated. In the former, it is effected by the affinities which form carbonic acid, and no water is formed.

Nitrous ether ſeems to differ from ſulphuric ether only in being combined with nitric oxide, at leaſt it is highly inflammable, pungent, volatile, and is not ſoluble in water, while it gives a deep olive colour to green ſalts of iron, and has a conſiderable ſpecific gravity. When ſimply waſhed with water, I found it 0.912, when the acid which it evidently contained was removed by ſaturating it with potaſs it became 0.896, and when rectified, by re-diſtilling it, it became 0.866, but recovered decidedly acid properties, probably from the nitric oxide being acidified by the air of the apparatus.

Medical uſe.—Spirit of nitrous ether has been long deſervedly held in great eſteem. It quenches thirſt, promotes the natural ſecretions, expels flatulencies, and moderately ſtrengthens the ſtomach. It may be given in doſes of from twenty drops to a drachm, in any convenient vehicle. Mixed with a ſmall quantity of ſpiritus ammoniæ aromaticus, it proves a mild, yet efficacious, diaphoretic, and often remarkably diuretic; eſpecially in ſome febrile caſes, where ſuch a ſalutary evacuation is wanted. A ſmall proportion of this ſpirit added to malt ſpirits, gives them a flavour approaching to that of French brandy.

CHAP. XIV.

HERBARUM et FLORUM EXSICCATIO.

Lond.

THE DRYING OF HERBS AND FLOWERS.

Let theſe, ſpread out lightly, be dried by a gentle heat.

Edin.

Herbs and flowers are to be dried by the gentle heat of a ſtove or common fire, in ſuch quantities at a time, that the proceſs may be finiſhed as quickly as poſſible; for by this means their powers are beſt preſerved; the teſt of which is the perfect preſervation of their natural colour.

The leaves of hemlock (*conium maculatum*), and of other plants containing a ſubtile volatile matter, muſt be immediately reduced to powder, after being dried, and afterwards kept in glaſs phials well corked.

Further obſervations on the drying and preſervation of ſimple ſubſtances will be found in pages 54 and 55 of the Elements of Pharmacy.

SCILLÆ EXSICCATIO. *Lond.*
The Drying of Squill.

Cut the ſquill, after having removed its dry coats, tranſverſely into thin ſlices, and dry it by a gentle heat.

Scilla Maritima Exsiccata. *Ed.*
Dried Sea Squill.

Cut the root of the ſea-ſquill, after having removed its external coat, tranſverſely into thin ſlices, and dry it by a gentle heat. The ſign of its being properly dried is, that although rendered friable, it retains its bitterneſs and acrimony.

Scillæ Præparatæ. *Dub.*
Prepared Squills.

Cut the ſquills, after having removed their membranaceous integuments, as thin as poſſible, and ſuſpend the cut ſlices in the ſhade to dry. When dry, reduce them to powder, which is to be kept in a corked phial.

By this method the ſquill dries much ſooner than when its ſeveral coats are only ſeparated; the internal part being here laid bare, which, in each of the entire coats, is covered with a thin ſkin, which impedes the exhalation of the moiſture. The root loſes in this proceſs four fifths of its original weight; the parts which exhale with a moderate heat appear to be merely watery: hence ſix grains of the dry root are equivalent to half a drachm of it when freſh; a circumſtance to be particularly regarded in the exhibition of this medicine. But if too great heat has been employed to dry it, it becomes almoſt inert, and it alſo loſes by long keeping in the ſtate of powder.

Dried ſquills furniſh us with a medicine, ſometimes advantageouſly employed as an emetic, often as an expectorant, but ſtill more frequently as a powerful diuretic.

MILLIPEDÆ PRÆPARATIO. *Lond.* Millipedæ Præparatæ. *Dub.*
The Preparation of Millipeds. Prepared Millipeds.

The millipeds are to be incloſed in a thin canvas cloth, and ſuſpended over hot proof ſpirit in a cloſe veſſel, till they be killed by the ſteam, and rendered friable.

This is the laſt remains of a juſtly exploded practice, which aſcribed extraordinary virtues to whatever was barbarous and diſguſting.

SPONGIÆ USTIO. *Lond.* SPONGIA USTA. *Dub.*

The Burning of Sponge. Burnt Sponge.

Cut the ſponge in pieces, and bruiſe it, ſo as to ~~free it~~ from ſmall ſtones; burn it in a cloſe iron veſſel, until it becomes black and friable; afterwards reduce it to a very fine powder.

This medicine has been in uſe for a conſiderable time, and employed againſt ſcrofulous diſorders and cutaneous foulneſſes, in doſes of a ſcruple and upwards. Its virtues probably depend on the preſence of a little alkali. It alſo contains charcoal; and its uſe may be entirely ſuperſeded by theſe ſubſtances, which may be obtained in other manners, at a much cheaper rate.

CHAP XV.

EXPRESSED JUICES.

The juices of ſucculent plants are obtained by expreſſion. They are of a very compound nature, conſiſting of the ſap, the ſecreted fluids, and fecula, mixed together. When firſt procured, they are very high coloured, turbid, and loaded with parenchymatous matter. They may be ſeparated by reſt, filtration, heat, and clarification. Reſt may be employed when the juice is very fluid, does not contain volatile matter, and is not ſuſceptible of alteration. It is, however, employed with advantage with ſub-acid juices, as that of lemons. By reſt they undergo a kind of ſlight fermentation, and all their mucilaginous, and other viſcid parts, ſeparate. Filtration is perhaps the moſt perfect, but it is tedious, and applicable only to very fluid juices. In many inſtances it may be facilitated by the addition of water. The action of heat is more expeditious, and is employed for juices which are very alterable, or which contain volatile matters. It is performed by introducing the juice into a matraſs, and immerſing it in boiling water for ſome minutes. The feculæ are coagulated, and eaſily ſeparated by filtration. Clarification by white of egg can only be uſed for very viſcid mucilaginous juices, which contain nothing volatile. The white of two eggs may be allowed to each pint of juice. They are beat to a fine froth, the juice gradually mixed with them, and the whole brought to ebullition. The albumen coagulating envelops all the parenchymatous and feculent matters, and the juice now paſſes the filter readily. By this proceſs juices are rendered ſufficiently fine; but the heat employed deepens their colour, and manifeſtly alters them, ſo that it is not merely a defecating, but a decompoſing, proceſs. When depurated, juices are yellow or red, but never green.

The fluids thus extracted from ſucculent fruits, whether acid or ſweet, from moſt of the acrid herbs, as ſcurvy-graſs and water-creſſes, from the acid herbs, as ſorrel and wood-ſorrel, from the aperient lacteſcent plants, as dandelion and hawkweed, and from ſundry other vegetables, contain great part of the peculiar taſte and virtues of the reſpective ſubjects. The juices, on the other hand, extracted from moſt of the aromatic herbs, have ſcarcely any thing of the flavour of the plants, and ſeem to differ little from decoctions of them made in water boiled till the volatile odorous parts have been diſſipated. Many of the odoriferous flowers, as the lily, violet, hyacinth, not only impart nothing of their fragrance to their juice, but have it totally deſtroyed by the previous bruiſing. From want of ſufficient attention to theſe particulars, practitioners have been frequently deceived in the effects of preparations of this claſs: juice of mint has been often preſcribed as a ſtomachic, though it wants thoſe qualities by which mint itſelf and its other preparations operate.

There are equal differences in regard to their preſerving thoſe virtues, and this independently of the volatility of the active matter, or its diſpoſition to exhale. Even the volatile virtue of ſcurvy-graſs may, by the above method, be preſerved almoſt entire in its juice for a conſiderable time; while the active parts of the juice of the wild cucumber quickly ſeparate and ſettle to the bottom, leaving the fluid part inert. Juices of arum root, iris root, bryony root, and other vegetables, in like manner allow their medicinal parts to ſettle at the bottom.

If juices are intended to be kept for any length of time, about one-fortieth part of their weight of good ſpirit of wine may be added, and the whole ſuffered to ſtand as before; a freſh ſediment will now be depoſited, from which the liquor is to be poured off, ſtrained again, and put into ſmall bottles which have been waſhed with ſpirit and dried. A little oil is to be poured on the ſurface, ſo as very nearly to fill the bottles, and the mouths cloſed with leather, paper, or ſtopped with ſtraw, as the flaſks are in which Florence oil is brought to us: this ſerves to keep out duſt, and ſuffers the air to eſcape, which in proceſs of time ariſes from all vegetable liquors, and which would otherwiſe endanger the burſting of the glaſſes; or, being imbibed afreſh, render their contents vapid and foul. The bottles are to be kept on the bottom of a good cellar or vault, placed up to the necks in ſand. By this method ſome juices may be preſerved for a year or two; and others for a much longer time, though, whatever care be taken, they are found to anſwer better when freſh; and from the difficulty of preſerving them, they have of late been very much laid aſide, eſpecially ſince we have been provided with more convenient and uſeful remedies. The following is the only compoſition of the kind retained in our pharmacopœias.

SUCCUS COCHLEARIÆ COMPOSITUS. *Lond.*

Compound Juice of Scurvy-Graſs.

Take of
Juice of Garden ſcurvy-graſs, two pints;
Brooklime,
Water-creſſes, of each one pint;
Seville oranges, twenty ounces by meaſure.

Mix them, and, after the feces have ſubſided, pour off the liquor, or ſtrain it.

SUCCUS COCHLEARIÆ OFFICINALIS COMPOSITUS; vulgo, SUCCI AD SCORBUTICOS. *Edin.*

Compound Juice of Scurvy-Graſs.

Take of
Juice of Scurvy-graſs,
Water-creſſes, expreſſed from freſh gathered herbs,
Seville oranges, of each two pounds;
Spirit of nutmegs, half a pound.

Mix them, and let them ſtand till the feces have ſubſided, then pour off the clear liquor.

BOTH theſe compoſitions are of conſiderable uſe for the purpoſes expreſſed in the title: the orange juice is an excellent aſſiſtant to the ſcurvy-graſs and other acrid antiſcorbutics; which, when thus mixed, have been found from experience to produce much better effects than when employed by themſelves. They may be taken in doſes from an ounce or two to a quarter of a pint, two or three times a-day: they generally increaſe the urinary ſecretion, and ſometimes induce a laxative habit.

CHAP. XVI.

INSPISSATED JUICES.

This is a very convenient form for the exhibition of thoſe ſubſtances which are ſufficiently ſucculent to afford a juice by expreſſion, and whoſe virtues do not reſide in any very volatile matter. By inſpiſſation, the bulk of the requiſite doſe is very much diminiſhed; they are reduced to a form convenient for making up into pills; and they are much leſs apt to ſpoil than the ſimple expreſſed juices. The mode of their preparation is not yet, however, reduced to fixed principles. Some direct the juices to be inſpiſſated as ſoon as they are expreſſed; others allow them previouſly to undergo a ſlight degree of fermentation; ſome defecate them before they proceed to inſpiſſate them, and laſtly, Baumé prepares his elaterium by inſpiſſating the defecated juice of the wild cucumber, while our colleges give the ſame name to the matter which ſubſides from it. The nature of the ſoil, of the ſeaſon, and many other circumſtances, muſt materially alter the quantity or nature of the product. In moiſt years Baumé got from thirty pounds of elder berries, four or five pounds of inſpiſſated juice, and in dry years only two, or two and a half. From hemlock he got in October 1769 $\frac{1}{12.5}$ of inſpiſſated juice, and in May of the ſame year only $\frac{1}{28.5}$; on the contrary, in Auguſt 1768 $\frac{1}{21.4}$, and in May 1770 $\frac{1}{15}$, but in general the product in the autumn months was greateſt. Hyociamus gave him about $\frac{1}{22.5}$, and belladonna $\frac{1}{14}$.

SUCCUS SPISSATUS ACONITI NAPELLI. *Ed.*
Inſpiſſated Juice of Wolfsbane.

Bruiſe the freſh leaves of wolfsbane; and including them in a hempen bag, compreſs them ſtrongly till they yield their juice, which is to be evaporated in flat veſſels heated with boiling water, ſaturated with muriate of ſoda, and immediately reduced to the conſiſtence of thick honey.

After the maſs has become cold, let it be put up in glazed earthen veſſels, and moiſtened with alcohol.

In the ſame manner prepared from their leaves,

SUCCI SPISSATI	*The Inſpiſſated Juices of*
Atropæ Belladonnæ,	*Deadly Nightſhade*

SUCCI SPISSATI	*The Inſpiſſated Juices of*
Conii maculati,	*Hemlock.*
Hyosciami nigri,	*Henbane.*
Lactucæ viroſæ,	*Poiſonous Lettuce.*

Succus Spissatus Cicutæ. *Dub.*

Inſpiſſated Juice of Hemlock.

Expreſs hemlock gathered when the flowers are juſt appearing, and allow the juice to ſtand ſix hours until the feces ſubſide; then reduce the decanted juice to dryneſs in a water bath.

In the ſame way is prepared from freſh gathered berries

Succus Spissatus Sambuci. *Dub.*

The Inſpiſſated Juice of Elder-berries.

Succus Baccæ Sambuci Spissatus. *Lond.*

Inſpiſſated Juice of the Elder-berry.

Take of

Expreſſed and depurated juices of elder-berries, two pints.

Inſpiſſate in a water bath ſaturated with ſea ſalt.

In the ſame manner inſpiſſate

SUCCUS	*The Juice of the*
Ribis nigri,	*Black Currant.*
Limonis,	*Lemon.*
Cicutæ, floribus primum apparentibus.	*Hemlock, when about to flower.*

Succus Spissatus Sambuci Nigri; vulgo, Rob Sambuci. *Ed.*

Inſpiſſated Juice of Elder-berries, commonly called *Elder Rob.*

Take of

Juice of ripe elder-berries, five pounds;

Double refined ſugar, one pound.

Evaporate with a gentle heat to the conſiſtence of pretty thick honey.

These inſpiſſated juices contain the virtues of the reſpective vegetables, in a very concentrated ſtate. Thoſe of the elder, black-current, and lemon, are acidulous, cooling, and laxative, and may be uſed in conſiderable quantities, while thoſe of the wolfsbane, hemlock, deadly nightſhade, henbane, and poiſonous lettuce, are highly narcotic and deleterious, and muſt be given only in very ſmall doſes.

Fœcula.

SUCCUS SPISSATUS MOMORDICÆ ELATERII; vulgo, ELATERIUM. *Ed.* ELATERIUM. *Lond.*

Inſpiſſated Juice of the Wild Cucumber. Elaterium.

Cut into ſlices ripe wild cucumbers, and paſs the juice, very lightly expreſſed, through a very fine hair ſieve, (into a glaſs veſſel, *Lond.*) then boil it a little and ſet it by for ſome hours until the thicker part has ſubſided. Pour off the thinner part ſwimming at the top, and ſeparate the reſt by filtering. Cover the thicker part, which remains after filtration, with a linen cloth, and dry it with a gentle heat.

THIS is not properly an inſpiſſated juice, but a depoſition from the expreſſed juice. Such depoſitions have long been called Fecula, and the denomination has been confirmed in modern times. Its application, however, appears to us to be too extended; for fecula is applied both to mild and nutritious ſubſtances, ſuch as ſtarch, and to draſtic ſubſtances, ſuch as that of which we are now treating. Beſides, if it poſſeſſed exactly the ſame chemical properties as ſtarch, it would be converted into a gelatinous maſs by the boiling directed by the Edinburgh college, and would not ſeparate; whereas, the boiling is intended to promote the ſeparation.

The filtration above directed, for draining off ſuch part of the watery fluid as cannot be ſeparated by decantation, is not the common filtration through paper, for this does not ſucceed here: the groſſer parts of the juice, falling to the bottom, form a viſcid cake upon the paper, which the liquid cannot paſs through. The ſeparation is to be attempted in another manner, by draining the fluid from the top. This is effected by placing one end of ſome moiſtened ſtrips of woollen cloth, ſkeins of cotton, or the like, in the juice, and laying the other end over the edge of the veſſel, ſo as to hang down lower than the ſurface of the liquor: by this management the ſeparation ſucceeds in perfection.

Med. uſe.—Elaterium is a very violent hydragogue cathartic. In general, previous to its operation, it excites conſiderable ſickneſs at ſtomach, and not unfrequently it produces ſevere vomiting. Hence it is ſeldom employed till other remedies have been tried in vain. But in ſome inſtances of aſcites it will produce a complete evacuation of water, where other cathartics have had no effect. Two or three grains are in general a ſufficient doſe. And perhaps the beſt mode of exhibiting it is by giving it only to the extent of half a grain at a time, and repeating that doſe every hour till it begins to operate.

Pulps.

PULPARUM EXTRACTIO. *Ed. Dub.*

The Extraction of Pulps.

Boil unripe pulpy fruits, and ripe ones if they be dry, in a ſmall quantity of water until they become ſoft; then preſs out the pulp through a hair ſieve, and afterwards boil it down to the conſiſtence of honey in an earthen veſſel, over a gentle fire; taking care to keep ſtirring the matter continually.

(The pulp of caſſia fiſtularis is in like manner to be boiled out from the bruiſed pod, and reduced afterwards to a proper conſiſtence, by evaporating the water.

The pulps of fruits that are both ripe and freſh, are to be preſſed out through the ſieve, without any previous boiling. *Ed.*)

PULPARUM PRÆPARATIO. *Lond.*

The Preparation of Pulps.

Set pulpy fruits, if they be unripe, or ripe and dry, in a moiſt place, that they may become ſoft, then preſs the pulps through a hair ſieve; afterwards boil them firſt with a gentle heat, and ſtir them frequently, then evaporate the water in a water bath, ſaturated with ſea ſalt, until the pulps acquire the proper conſiſtency.

Pour boiling water on the bruiſed pods of the caſſia fiſtularis, ſo as to waſh out the pulp; then preſs the matter firſt through a coarſe ſieve, and then through a hair ſieve; laſtly, evaporate the moiſture in a water bath, ſaturated with ſea ſalt, ſo as to reduce the pulp to a proper conſiſtency.

Expreſs the pulps of ripe recent fruits through a ſieve, without boiling them.

WHEN theſe fruits are not ſufficiently juicy to afford a pulp by ſimple expreſſion, the decoction ordered by the Edinburgh and Dublin colleges is much more certain, and in every reſpect preferable to expoſing them to a moiſt air, which is not only often inefficacious, but is apt to render them ſpoilt and mouldy. On the other hand, the precaution uſed by the London college, of finiſhing the evaporation in a water bath, is highly proper, as otherwiſe they are extremely apt to become empyreumatic.

The pulps expreſſed from recent ſubſtances without coction, are leſs mucilaginous, are more apt to allow their fluid parts to ſeparate when left at reſt, than when they have been previouſly boiled; and very ſucculent vegetables, ſuch as apples, pears, and lily roots, may be roaſted in hot aſhes inſtead of being boiled.

CHAP. XVII.

FIXED OILS.

These oils are commonly denominated Expreſſed oils, an appellation which is manifeſtly improper, as in ſome inſtances they are obtained without expreſſion, and in other inſtances expreſſion is employed to obtain volatile oils. The Edinburgh college have therefore diſtinguiſhed theſe different claſſes of oils by the terms Fixed and Volatile, which accurately characterize them.

Fixed oil is formed in no other part of vegetables than in their ſeeds. Sometimes, although very rarely, it is contained in the parenchyma of the fruit. Of this the beſt known example is the olive. But it is moſt commonly found in the ſeeds of dicotyledonous vegetables, ſometimes alſo in the fruit of monocotyledonous plants, as the cocos butyracea. It has various degrees of conſiſtency, from the tallow of the croton ſebiferum of China, and the butter of the butter-tree of Africa, to the fluidity of olive oil.

Fixed oils are either

1. Fat, eaſily congealed, and not inflammable by nitric acid, oil of olives, almonds, rapeſeed, and ben.
2. Drying, not congealable, inflammable by nitric acid, oil of linſeed, nut, and poppy.
3. Concrete oils, palm oil, &c.

Fixed oil is ſeparated from fruits and ſeeds which contain it, either by expreſſion or decoction. Heat, by rendering the oil more limpid, increaſes very much the quantity obtained by expreſſion; but as it renders it leſs bland, and more apt to become rancid, heat is not uſed in the preparation of oils which are to be employed in medicine. When obtained by expreſſion, oils often contain a mixture of mucilage, ſtarch, and colouring matter; but part of theſe ſeparate in courſe of time, and fall to the bottom. When oils become rancid, they are no longer fit for internal uſe, but are then ſaid to effect the killing of quickſilver, as it is called, more quickly. Decoction is principally uſed for the extraction of the viſcid and conſiſtent oils, which are melted out by the heat of the boiling water, and riſe to its ſurface.

Thoſe who prepare large quantities of the oil of almonds, blanch them, by ſteeping them in very hot water, which cauſes their epidermis to ſwell, and ſeparate eaſily. After they peel them, they dry them in a ſtove, then grind them in a mill like a coffee mill, and laſtly, expreſs the oil from the paſte incloſed in a hempen bag. By blanching the almonds, the paſte which remains within the bag is ſold with greater advantage to the perfumers, and the oil obtained is perfectly colourleſs. But the heat employed diſpoſes the oil to become rancid, and the colour the oil acquires from the epidermis does not injure its qualities. For pharmaceutical uſe, therefore, the oil ſhould not be expreſſed from blanched almonds, but merely rubbed in a piece of coarſe linen, to ſeparate the brown powder adhering to the epidermis, as much as poſſible. Sixteen ounces of ſweet almonds commonly give five ounces and a half of oil. Bitter almonds afford the ſame proportions, but the oil has a pleaſant bitter taſte.

OLEUM AMYGDALÆ COMMUNIS. *Edin.*
Almond Oil.

Take of
  Freſh almonds, any quantity.

After having bruiſed them in a ſtone mortar, put them into a hempen bag, and expreſs the oil without heat.

In the ſame manner is to be expreſſed from its ſeeds,

Oleum Lini Usitatissimi, *Oil of Linſeed.*

Oleum Amygdalæ. *Lond.*
Almond Oil.

Pound freſh almonds, either ſweet or bitter, in a mortar, then preſs out the oil in a cold preſs.

In the ſame manner are to be expreſſed,

Oleum Lini,	*Linſeed Oil*, from the bruiſed ſeeds.
Oleum Ricini,	*Caſtor Oil*, from the ſeeds previouſly decorticated.
Oleum Sinapeos,	*Oil of Muſtard*, from the bruiſed ſeeds

Oleum Amygdalarum. *Dub.*
Oil of Almonds.

Bruiſe freſh almonds in a mortar, and expreſs the oil in a preſs without heat.

In the ſame way are to be expreſſed from the ſeeds,

Oleum Lini,	*Linſeed Oil.*
Oleum Sinapis,	*Oil of Muſtard.*

The chemical properties of theſe oils have been already mentioned, and an account of the medical virtues of each will be found in their reſpective places in the materia medica.

CHAP. XVIII.

OILY PREPARATIONS.

OLEUM AMMONIATUM, vulgo LINIMENTUM VOLATILE. *Ed.*

Ammoniated Oil, commonly called *Volatile Liniment*.

Take of
  Olive oil, two ounces;
  Water of ammonia, two drachms,
Mix them together.

LINIMENTUM AMMONIÆ FORTIUS. *Lond.*

Stronger Liniment of Ammonia.

Take of
  Water of pure ammonia, one ounce;
  Olive oil, two ounces.
Shake them together in a phial.

LINIMENTUM AMMONIÆ. *Lond.*

Liniment of Ammonia.

Take of
  Water of ammonia, half an ounce;
  Olive oil, one ounce and a half.
Shake them together in a phial till they are mixed.

The moſt commonly adopted generic name for the combination of oil with alkalies is Soap, and the ſpecies are diſtinguiſhed by the addition of that of the alkali they contain. On theſe principles, volatile liniment ſhould be called Soap of Ammonia, as hard ſoap is ſoap of ſoda, and ſoft ſoap, ſoap of potaſs.

The ammonia uſed in the two firſt of theſe preparations combines much more eaſily and intimately with the oil than the carbonate of ammonia uſed in the laſt. If the carbonate be employed with the view of rendering the preparation leſs ſtimulating, the ſame end will be more ſcientifically obtained, by increaſing the proportion of oil mixed with pure ammonia. The two firſt of theſe liniments differ greatly in point of ſtrength, the proportion of water of ammonia in the firſt, being as 1 to 8, and in the ſecond as 1 to 2.

Med. uſe.—They are frequently uſed externally as ſtimulants and rubefacients. In inflammatory ſore throats, a piece of flannel moiſtened with theſe ſoaps, applied to the throat, and renewed every four or five hours, is one of the moſt efficacious remedies. By means of this warm ſtimulating application, the neck, and ſometimes the whole body, is put into a ſweat, which, after bleeding, either carries off, or leſſens the inflammation. When too ſtrong, or too liberally applied, they ſometimes occaſion inflammations, and even bliſters. Where the ſkin cannot bear their acrimony, a larger proportion of oil may be uſed.

But the firſt of theſe preparations is even ſometimes uſed internally, made into a mixture with ſyrup and ſome aromatic water. A drachm or two taken in this manner three or four times a-day, is a powerful remedy in ſome kinds of catarrh and ſore throat.

OLEUM LINI CUM CALCE. *Ed.*

Linſeed Oil with Lime.

Take of
  Linſeed oil,
  Lime water, of each equal parts.
Mix them.

This liniment is extremely uſeful in caſes of ſcalds or burns, being ſingularly efficacious in preventing, if applied in time, the inflammation ſubſequent to burns or ſcalds; or even in removing it, after it has come on.

It is alſo a ſpecies of ſoap, and might be called Soap of Lime, although it probably contains a great exceſs of oil.

OLEUM CAMPHORATUM. *Ed.*

Camphorated Oil.

Take of
  Olive oil, two ounces;
  Camphor, half an ounce.
Mix them ſo that the camphor may be diſſolved.

This is a ſimple ſolution of camphor in fixed oil, and is an excellent application to local pains from whatever cauſe, and to glandular ſwellings.

OLEUM SULPHURATUM. *Ed.*

Sulphuretted Oil.

Take of
  Olive oil, eight ounces;
  Sublimed ſulphur, one ounce.
Boil them together in a large iron pot, ſtirring them continually, till they unite.

[illegible] *Lond.*

Take of
  Flowers of ſulphur, four ounces.
  Olive oil, ſixteen ounces, by weight.
Boil the flowers of ſulphur, with the oil, in a pot ſlightly covered, until they be united.

Göttling directs the oil to be heated in an iron pot, and the ſulphur to be gradually added, while the ſolution is promoted by conſtant ſtirring with an iron ſpatula. The pot muſt be ſufficiently large, as the mixture ſwells and boils up very much; and as it is apt to catch fire, a lid ſhould be at hand to extinguiſh it by covering up the pot.

Medical uſe.—Sulphuretted oil was formerly ſtrongly recommended in coughs, conſumptions, and other diſorders of the breaſt and lungs: but the reputation which it had in theſe caſes, does not appear to have been derived from any fair trial or experience. It is manifeſtly hot, acrimonious, and irritating; and ſhould therefore be uſed with the utmoſt caution. It has frequently been found to injure the appetite, offend the ſtomach and viſcera, parch the body, and occaſion thirſt and febrile heats. The doſe of it is from ten to forty drops. It is employed externally for cleanſing and healing foul running ulcers; and Boerhaave conjectures, that its uſe in theſe caſes gave occaſion to the virtues aſcribed to it when taken internally.

Off. prep.—Emplaſt. ammon. cum hydrarg. *Lond.* Emp. lith. cum hyd. *Lond.*

PETROLEUM SULPHURATUM. *Lond.*

Sulphuretted Petroleum

Is prepared in the ſame way as ſulphuretted oil.

CHAP. XIX.

DISTILLED WATERS.

Substances which differ in volatility, may be ſeparated from each other by applying a degree of heat capable of converting the moſt volatile into vapour, and by again condenſing this vapour in a proper apparatus. Water is converted into vapour at 212°, and may be ſeparated by diſtillation from the earthy and ſaline matters which it always contains in a natural ſtate. But, it is evident, that if any ſubſtances which are as volatile as water, be expoſed to the ſame degree of heat, either by immerſing them in boiling water, or expoſing them to the action of its ſteam, they will riſe with it in diſtillation. In this way the camphor and volatile oils of vegetable ſubſtances are ſeparated from the more fixed principles; and as water is capable of diſſolving a certain quantity of theſe volatile ſubſtances, it may be impregnated with a great variety of flavours by diſtilling it from different aromatic ſubſtances. If the ſubject of our diſtillation contain more volatile oil than the water employed is capable of diſſolving, it will render the water milky, and afterwards ſeparate from it. It is in this way that eſſential oils are obtained.

Eſſential oils are obtained only from odoriferous ſubſtances; but not equally from all of this claſs, nor in quantity proportional to their degree of odour. Some, which, if we were to reaſon from analogy, ſhould ſeem very well fitted for this proceſs, yield extremely little oil, and others none at all. Roſes and chamomile flowers, whoſe ſtrong and laſting ſmell promiſes abundance, are found to contain but a ſmall quantity of oil: the violet and jaſſamine flower, which perfume the air with their odour, loſe their ſmell upon the gentleſt coction, and do not afford any oil, on being diſtilled, unleſs immenſe quantities are ſubmitted to the operation at once; while ſavin, whoſe diſagreeable ſcent extends to no great diſtance, gives out the largeſt proportion of oil of almoſt any vegetable known.

Nor are the ſame plants equally fit for this operation, when produced in different ſoils or ſeaſons, or at different times of their growth. Some yield more oil if gathered when the flowers begin to fall off than at any other time. Of this we have examples in lavendar and rue; others, as ſage, afford the largeſt quantity when young, before they have ſent forth any flowers; and others, as thyme, when the flowers have juſt appeared. All fragrant herbs yield a larger proportion of oil, when produced in dry ſoils and in warm ſummers, than in oppoſite circumſtances. On the other hand, ſome of the diſagreeable ſtrong-ſcented ones, as wormwood, are ſaid to contain moſt oil in rainy ſeaſons, and when growing in moiſt rich grounds.

Several chemiſts have been of opinion, that herbs and flowers, moderately dried, yield a greater quantity of eſſential oil, than if they were diſtilled when freſh. It is, however, highly improbable, that the quantity of eſſential oil will be increaſed by drying; on the contrary, part of it muſt be diſſipated and loſt. But drying may ſometimes be uſeful in other ways; either by diminiſhing the bulk of the ſubject to be diſtilled, or by cauſing it to part with its oil more eaſily.

The choice of proper inſtruments is of great conſequence for the performance of this proceſs to advantage. There are ſome oils which paſs freely over the ſwan-neck of the head of the common ſtill; others, leſs volatile, cannot eaſily be made to riſe ſo high. For obtaining theſe laſt, we would recommend a large low head, having a rim or hollow canal round it: in this canal, the oil is detained in its firſt aſcent, and thence conveyed at once into the receiver, the advantages of which are ſufficiently obvious.

With regard to the proportion of water to be employed; if whole plants, moderately dried, are uſed, or the ſhavings of woods, as much of either may be put into the veſſel as, lightly preſſed, will occupy half its cavity; and as much water may be added as will fill two thirds of it. When freſh and juicy herbs are to be diſtilled, thrice their weight of water will be fully ſufficient; but dry ones require a much larger quantity. In general, there ſhould be ſo much water, that after all intended to be diſtilled has come over, there may be liquor enough left to prevent the matter from burning to the ſtill. The water and ingredients, altogether, ſhould never take up more than three fourths of the ſtill; there ſhould be liquor enough to prevent any danger of an empyreuma, but not ſo much as to be apt to boil over into the receiver.

The ſubject of diſtillation ſhould be macerated in the water until it be perfectly penetrated by it. To promote this effect, woods ſhould be thinly ſhaved acroſs the grain, or ſawn, roots cut tranſverſely into thin ſlices, barks reduced into coarſe powder, and ſeeds ſlightly bruiſed. Very compact and tenacious ſubſtances require the maceration to be continued a week or two, or longer; for thoſe of a ſofter and looſer texture, two or three days are ſufficient; while ſome tender herbs and flowers not only ſtand in no need of maceration, but are even injured by it. The fermentation which was formerly preſcribed in ſome inſtances, is always hurtful.

With regard to the fire, the operator ought to be expeditious in raiſing it at firſt, and to keep it up during the whole proceſs, to ſuch a degree only, that the oil may freely diſtil; otherwiſe the oil will be expoſed to an unneceſſary heat; a circumſtance which ought as much as poſſible to be avoided. Fire communicates to all theſe oils a diſagreeable impregnation, as is evident from their being much leſs grateful when newly diſtilled, than after they have ſtood for ſome time in a cool place: and the longer the heat is continued, the greater alteration it produces in them.

The greater number of oils require for their diſtillation the heat of water ſtrongly boiling: but there are many alſo which riſe with a heat conſiderably leſs; ſuch as thoſe of lemon and citron peel; of the flowers of lavender and roſemary, and of almoſt all the more odoriferous kinds of flowers. We have already obſerved, that theſe flowers have their fragrance much injured, or even deſtroyed, by beating or bruiſing them; it is impaired alſo by the immerſion in water in the preſent proceſs, and the more ſo in proportion to the continuance of the immerſion and the heat; hence oils, diſtilled in the common manner, prove much leſs agreeable in ſmell than the ſubjects themſelves. For the diſtillation of ſubſtances of this claſs, another method has been contrived; inſtead of being immerſed in water, they are expoſed only to its vapour. A proper quantiy of water being put into the bottom of the ſtill, the odoriferous herbs or flowers are laid lightly in a baſket, of ſuch a ſize that it may enter into the ſtill, and reſt againſt its ſides, juſt above the water. The head being then fitted on, and the water made to boil, the ſteam, percolating through the ſubject, imbibes the oil, without impairing its fragrance, and carries it over into the receiver. Oils thus obtained, poſſeſs the odour of the ſubject in an exquiſite degree, and have nothing of the diſagreeable ſcent perceivable in thoſe diſtilled by boiling them in water in the common manner.

Plants differ ſo much, according to the ſoil and ſeaſon of which they are the produce, and likewiſe according to their own ages, that it is impoſſible to fix the quantity of water to be drawn from a certain weight of them to any invariable ſtandard. The diſtillation may always be continued as long as the liquor runs well flavoured off the ſubject, but no longer.

In the diſtillation of eſſential oils, the water, as was obſerved in a foregoing ſection, imbibes always a part of the oil. The diſtilled liquors here treated of, are no other than water thus impregnated with the eſſential oil of the ſubject; whatever ſmell, taſte, or virtue, is communicated to the water, or obtained in the form of watery liquor, being found in a concentrated ſtate in the oil.

All thoſe vegetables, therefore, which contain an eſſential oil, will give over ſome virtue to water by diſtillation: but the degree of the impregnation of the water, or the quantity of water which a plant is capable of ſaturating with its virtue, are by no means in proportion to the quantity of its oil. The oil ſaturates only the water that comes over at the ſame time with it: if there be more oil than is ſufficient for this ſaturation, the ſurplus ſeparates, and concretes in its proper form, not miſcible with the water that ariſes afterwards. Some odoriferous flowers, whoſe oil is in ſo ſmall quantity that ſcarcely any viſible mark of it appears, unleſs fifty or an hundred pounds or more are diſtilled at once, give nevertheleſs as ſtrong an impregnation to water as thoſe plants which abound moſt with oil.

Many have been of opinion, that diſtilled waters may be more and more impregnated with the virtues of the ſubject, and their ſtrength increaſed to any aſſigned degree, by *cohobation*, that is, by re-diſtilling them repeatedly from freſh parcels of the plant. Experience, however, ſhews the contrary. A water ſkilfully drawn in the firſt diſtillation, proves on every repeated one not ſtronger but more diſagreeable. Aqueous liquors are not capable of imbibing above a certain quantity of the volatile oil of vegetables; and this they may be made to take up by one, as well as by any number of diſtillations: the oftener the proceſs is repeated, the ungrateful impreſſion which they generally receive from the fire, even at the firſt time, becomes greater and greater.

Thoſe plants, which do not yield at firſt waters ſufficiently ſtrong, are not proper ſubjects for this proceſs.

The mixture of water and oil which comes over, may either be ſeparated immediately by means of a ſeparatory, or after it has been put into large narrow-necked bottles, and placed in a cool place, that the portion of oil which is not diſſolved in the water may riſe to the top, or ſink to the bottom, according to its ſpecific gravity. It is then to be ſeparated, either by a ſeparatory, (Plate I. fig. 10.); or by means of a ſmall glaſs ſyringe; or by means of a filter of paper; or, laſtly, by means of a woollen thread, one end of which is immerſed in the oil, and the other lower end in a phial: the oil will thus paſs over into the phial by capillary attraction, and the thread is to be ſqueezed dry.

Moſt diſtilled waters, when firſt prepared, have a ſomewhat unpleaſant ſmell, which however they gradually loſe: it is therefore adviſable to keep them for ſome days after their preparation in veſſels but ſlightly covered; and not to cork them up until they loſe that ſmell.

That the waters may keep the better, about one twentieth part their weight of proof ſpirit may be added to each after they are diſtilled. I have been informed by a reſpectable apothecary, that if the ſimple diſtilled waters be rectified by diſtilling them a ſecond time, they will keep for ſeveral years without the addition of any ſpirit, which alway gives an unpleaſant flavour, and is often objectionable for other reaſons.

Diſtilled waters are employed chiefly as grateful diluents, as ſuitable vehicles for medicines of greater efficacy, or for rendering diſguſtful ones more acceptable to the palate and ſtomach: few are depended on, with any intention of conſequence, by themſelves.

To the chapter on Simple Diſtilled Waters, the London college have annexed the following remarks.

We have ordered moſt of the waters to be diſtilled from the dried herbs, becauſe freſh are not ready at all times of the year. Whenever the freſh are uſed, the weights are to be increaſed. But, whether the freſh or dried herbs be employed, the operator may vary the weight according to the ſeaſon in which they have been produced and collected.

Herbs and ſeeds kept beyond the ſpace of a year, become leſs proper for the diſtillation of waters.

To every gallon of theſe waters add five ounces, by meaſure, of proof ſpirit.

The Edinburgh college order half an ounce of proof ſpirit to every pound of the water, which is nearly the ſame.

But the Dublin college order five ounces of proof ſpirit to be added to each *pound*, which is probably a typographical error.

AQUA DISTILLATA. *Lond.*

Diſtilled Water.

Take of

Spring water, ten gallons.

Draw off by diſtillation, firſt, four pints; which being thrown away, draw off four gallons. This water is to be kept in a glaſs or earthen bottle with a glaſs ſtopper.

Dub.

Take of

Spring water, twenty pounds.

Put it into a retort, and having thrown away the firſt pound, draw off ten pounds by diſtillation with a gentle heat.

Edin.

Let water be diſtilled in very clean veſſels, until about two thirds have come over.

Water is never found pure in a ſtate of nature; and as it is abſolutely neceſſary, particularly for many chemical operations, that it ſhould be perfectly ſo, we muſt ſeparate it from all heterogeneous matters by diſtillation. The firſt portion that comes over ſhould be thrown away, not ſo much from the poſſibility of its being impregnated with volatile matters contained in the water, as from the probability that it will be contaminated with impurities it may have contracted in its paſſage through the worm in the refrigeratory. The diſtillation is not to be puſhed too far, leſt the water ſhould acquire an empyreumatic flavour.

Although diſtilled water be neceſſary for many purpoſes, we apprehend that the London college, from a deſire of extreme elegance, have fallen into a very conſiderable error in ordering it to be employed for many purpoſes, ſuch as infuſions and decoctions, for which good ſpring water would anſwer juſt as well, and for which, we will venture to ſay, that it never is employed by the apothecary. The conſequence is, that the apothecary has no rule to direct him, when it is abſolutely neceſſary, and when it may be diſpenſed with, and he will therefore probably diſpenſe with it oftener than is proper.

AQUA CITRI AURANTII. *Edin.*
Orange-Peel Water.

Take of

Freſh orange-peel, two pounds.

Pour upon it as much water as ſhall be ſufficient to prevent any empyreuma, after ten pounds have been drawn off by diſtillation. After due maceration, diſtil ten pounds.

AQUA FOENICULI DULCIS. *Dub. Lond.*
Fennel Water.

Take of

The bruiſed ſeeds of ſweet fennel, one pound;

Water, as much as may be ſufficient to prevent empyreuma.

Diſtil one gallon (ten pounds, *Dub.*)

THE ſame quantity of water is to be diſtilled in the ſame manner from

Six pounds of the recent petals of the DAMASK ROSE, *Aqua Roſæ Centifoliæ.* Edin.
Aqua Roſæ. Lond. Dub.

Off. prep.—Ungt. adipis ſcill. *Lond.*

Three pounds, *Edin.*; one pound and a half, *Lond. Dub.* of PEPPERMINT, *Aqua Menthæ Piperitæ.* Edin.
Aqua Menthæ Piperitidis. Lond. Dub.

Three pounds, *Ed.*; one pound and a half, *Lond. Dub.* of PENNYROYAL, in flower,

Aqua Menthæ Pulegii. Edin.
Aqua Pulegii. Lond. Dub.

Two pounds of freſh LEMON PEEL,

Aqua Citri Medicæ. Edin.

One pound and a half of SPEARMINT,

Aqua Menthæ Sativæ. Dub. Lond.

One pound of CINNAMON, (macerated for a day, *Lond. Dub.*)

Aqua Lauri Cinnamomi. Edin.
Aqua Cinnamomi. Lond. Dub.

One pound of CASSIA, *Aqua Lauri Caſſiæ.* Edin.

One pound of bruiſed DILL SEEDS,

Aqua Anethi. Lond.

Half a pound of PIMENTO, (macerated for a day, *Lond.*)

Aqua Myrti Pimentæ. Edin.
Aqua Pimento. Lond.

THE virtues of all theſe waters are nearly alike; and the peculiarities of each will be eaſily underſtood by conſulting the account given in the materia medica of the ſubſtance from which they are prepared. Mr. Nicholſon mentions, that as roſe water is exceedingly apt to ſpoil, the apothecaries generally prepare it in ſmall quantities at a time from the leaves, preſerved by packing them cloſely in cans with common ſalt. This we underſtand is not the practice in Edinburgh, and indeed cannot ſucceed with the petals of the damaſk roſe, for they loſe their ſmell by drying. The London apothecaries, therefore, probably uſe the red roſe. The ſpoiling of ſome waters is owing to ſome mucilage carried over in the diſtillation; for, if rectified by a ſecond diſtillation, they keep perfectly.

CHAP. XX.

VOLATILE OILS.

OLEA VOLATILIA. *Edin.*

Volatile Oils.

VOLATILE OILS are prepared nearly in the ſame manner as the diſtilled waters, except that leſs water is to be added. Seeds and woody ſubſtances are to be previouſly bruiſed or raſped. The oil comes over with the water, and is afterwards to be ſeparated from it, according as it may be lighter than the water, and ſwim upon its ſurface, or heavier, and ſink to the bottom.

Beſides, in preparing theſe diſtilled waters and oils, it is to be obſerved, that the goodneſs of the ſubject, its texture, the ſeaſon of the year, and ſimilar cauſes, muſt give riſe to ſo many differences, that no certain or general rule can be given to ſuit accurately each example. Therefore, many things are omitted, to be varied by the operator according to his judgment, and only the moſt general precepts are given.

OLEA DISTILLATA, *Lond.*

Diſtilled Oils.

Let theſe oils be drawn off by diſtillation, from an alembic with a large refrigeratory; but, to prevent empyreuma, water muſt be added to the ingredients; in which they muſt be macerated before diſtillation.

The water which comes over with the oil in diſtillation is to be kept for uſe.

Dub.

Let the oil be extracted by diſtillation from the ſubject previouſly macerated in water, with the addition of as much water as may be ſufficient to prevent empyreuma.

In diſtilling fennel, peppermint, ſpearmint, and pennyroyal, the water which comes over along with the oil is to be preſerved for uſe in the manner directed in the chapter on Diſtilled Waters.

The herbs from which oils are to be extracted by diſtillation, are to be dried as ſoon as they are collected.

According to theſe directions, are prepared the

Volatile, Diſtilled, or Eſſential, OILS of } { *OLEA Volatilia*, Edin. *Diſtillata*, Dub. *vel Eſſentialia*. Lond.

Aniſe, { *Pimpinellæ aniſi*. Edin. *Aniſi*. Lond. Dub.

Off. prep.—Tinct. opii ammon. *Ed.* Tinct. opii camph. *Lond. Dub.*

Caraway, *Carui*. Lond. Dub.

Off. prep.—Elect. ſennæ, *Dub.* Elect. ſcammon. *Lond. Dub.* Pil. aloet, *Lond.*

Fennel ſeeds, *Seminum fœniculi dulcis*. Dub.

from the Seeds.

Juniper berries,	*Juniperi communis.* Edin. *Baccarum juniperi.* Dub. *Juniperi baccæ.* Lond.

from the Berries.

Pimento,	*Myrti pimentæ.* Edin.

from the Fruit.

Fennel flowers,	*Florum fœniculi dulcis.* Dub.
Roſemary,	*Roriſmarini officinalis.* Edin. *Roriſmarini.* Lond. Dub.

Off. prep.—Tinct. ſapon. *Ed.* Linim ſapon. *Dub.* Alcohol amm. arom. *Ed.*

Lavender,	*Lavandulæ ſpicæ.* Edin. *Lavendulæ.* Lond.

Off. prep.—Ungt. ſulph. *Ed.*

Peppermint,	*Menthæ piperitæ.* Edin. ——— *piperitidis.* Lond. Dub.

Off. prep—Pil rhoei comp. *Ed.*

Spearmint,	*Menthæ ſativæ.* Lond. Dub.

Off. prep.—Ungt. lad. comp. *Lond.*

Pennyroyal,	*Pulegii.* Lond. Dub.
Origanum,	*Origani.* Lond. Dub.
Rue,	*Rutæ.* Dub.
Savine,	*Juniperi ſabinæ.* Ed. *Sabinæ.* Dub.

from the Flower, or Herb in flower. And of

Saſſafras,	*Lauri ſaſſafras.* Edin. *Saſſafras.* Lond.

from the Root.

OLEUM TEREBINTHINÆ. *Lond. Dub.*

Oil of Turpentine.

Take of

Common turpentine, five pounds.

Water, four pints, (four pounds, *Dub.*)

Diſtil (two pounds, *Dub.*) (the turpentine with the water in a copper alembic, *Lond.*) After the diſtillation of the oil, what remains, (in the retort, *Dub.*) is yellow reſin.

OLEUM TEREBINTHINÆ VOLATILE PURISSIMUM. *Edin.* OLEUM TEREBINTHINÆ RECTIFICATUM. *Lond. Dub.*

Rectified Oil of Turpentine.

Take of

Oil of turpentine, one pound, (two pounds, *Dub.*);
Water, four pints, (four pounds, *Dub.*)

Diſtil (a pound and a half, *Dub.*) (as long as any oil comes over, *Edin.*)

The proceſs here propoſed for rectifying this oil, is not only tedious, but accompanied with danger. For unleſs the luting be very cloſe, ſome of the vapour will be apt to get through; and if this catch fire, it will infallibly burſt the veſſels. This rectified oil, which in many pharmacopœias is ſtyled Ethereal, does not conſiderably differ in ſpecific gravity, ſmell, taſte, or medical qualities, from the former.

The Spirit of Turpentine, as this eſſential oil has been ſtyled, is frequently taken internally as a diuretic and ſudorific; and it has ſometimes a conſiderable effect when taken to the extent of a few drops only. It has, however, been given in much larger doſes, eſpecially when mixed with honey. Recourſe has principally been had to ſuch doſes in caſes of chronic rheumatiſm, particularly in thoſe modifications of it which are termed ſciatica and lumbago; but ſometimes they induce bloody urine.

The water employed in the diſtillation of volatile oils always imbibes ſome portion of the oil; as is evident from the ſmell, taſte, and colour, which it acquires. It cannot, however, retain above a certain quantity; and therefore, ſuch as has been already uſed and almoſt ſaturated itſelf, may be advantageouſly employed, inſtead of common water, in a ſecond, third, or any future, diſtillation of the ſame ſubject.

After the diſtillation of one oil, particular care ſhould be had to clean the worm perfectly before it be employed in the diſtillation of a different ſubſtance. Some oils, thoſe of wormwood and aniſeeds for inſtance, adhere to it ſo tenaciouſly, as not to be melted out by heat, or waſhed off by water: the beſt way of removing theſe, is to run a little ſpirit of wine through it.

Volatile oils, after they are diſtilled, ſhould be ſuffered to ſtand for ſome days, in veſſels looſely covered with paper, till they have loſt their diſagreeable fiery odour, and become limpid: then put them up in ſmall bottles, which are to be kept quite full, cloſely ſtopped, in a cool place. With theſe cautions, they will retain their virtues in perfection for many years.

Moſt of the oils mentioned above, are prepared by our chemiſts in Britain, and are eaſily procurable in a tolerable degree of perfection: but the oils from the more expenſive ſpiceries, though ſtill introduced among the preparations in the foreign pharmacopœias, are, when employed among us, uſually imported from abroad.

Theſe are frequently ſo much adulterated, that it is not eaſy to meet with ſuch as are at all fit for uſe. Nor are theſe adulterations eaſily diſcoverable. The groſſer abuſes, indeed, may be readily detected. Thus, if the oil be mixed with ſpirit of wine, it will turn milky on the addition of water; if with expreſſed oils, rectified ſpirit will diſſolve the volatile, and leave the other behind: if with oil of turpentine, on dipping a piece of paper in the mixture, and drying it with a gentle heat, the turpentine will be betrayed by its ſmell. But the more ſubtile artiſts have contrived other methods of ſophiſtication, which elude all trials of this kind.

Some have looked upon the ſpecific gravity of oils as a certain criterion of their genuineneſs. This, however, is not to be abſolutely depended on; for the genuine oils, obtained from the ſame ſubjects, often differ in gravity as much as thoſe drawn from different ones. Cinnamon and cloves, whoſe oils uſually ſink in water, yield, if ſlowly and warily diſtilled, oils of great fragrancy, which are nevertheleſs ſpecifically lighter than the aqueous fluid employed in their diſtillation; whilſt, on the other hand, the laſt runnings of ſome of the lighter oils prove ſometimes ſo ponderous as to ſink in water.

As all volatile oils agree in the general properties of ſolubility in ſpirit of wine, indiſſolubility in water, miſcibility with water by the intervention of certain intermedia, volatility in the heat of boiling water, &c. it is plain that they may be variouſly mixed with each other, or the dearer ſophiſticated with the cheaper, without any poſſibility of diſcovering the abuſe by any trials of this kind. And, indeed, it would not be of much advantage to the purchaſer, if he had infallible criteria of the genuineneſs of every individual oil. It is of as much importance that they be *good*, as that they be *genuine;* for genuine oils, from inattentive diſtillation, and long and careleſs keeping, are often weaker both in ſmell and taſte than the common ſophiſticated ones.

The ſmell and taſte ſeem to be the only certain teſts of which the nature of the thing will admit. If a bark ſhould have in every reſpect the appearance of good cinnamon, and ſhould be proved indiſputably to be the genuine bark of the cinnamon tree; yet if it want the cinnamon flavour, or has it but in a low degree, we reject it; and the caſe is the ſame with the oil. It is only from uſe and habit, or compariſons with ſpecimens of known quality, that we can judge of the goodneſs, either of the drugs themſelves, or of their oils.

Moſt of the volatile oils indeed, are too hot and pungent to be taſted with ſafety; and the ſmell of the ſubject is ſo much concentrated in them, that a ſmall variation in this reſpect is not eaſily diſtinguiſhed: but we can readily dilute them to any aſſignable degree. A drop of the oil may be diſſolved in ſpirit of wine, or received on a bit of ſugar, and diſſolved by that intermedium in water. The quantity of liquor which it thus impregnates with its flavour, or the degree of flavour which it communicates to a certain determinate quantity, will be the meaſure of the degree of goodneſs of the oil.

Medical uſe.—Volatile oils, medicinally conſidered, agree in the general qualities of pungency and heat; in particular virtues, they differ as much as the ſubjects from which they are obtained, the oil being the direct principle in which the virtues, or at leaſt a conſiderable part of the virtues, of the ſeveral ſubjects reſide. Thus the carminative virtue of the warm ſeeds, the diuretic of juniper berries, the emmenagogue of ſavin, the nervine of roſemary, the ſtomachic of mint, the antiſcorbutic of ſcurvy-graſs, the cordial of aromatics, &c. are ſuppoſed to be concentrated in their oils.

There is another remarkable difference in volatile oils, the foundation of which is leſs obvious, that of the degree of their pungency and heat. Theſe are by no means in proportion, as might be expected, to thoſe of the ſubject they were drawn from. The oil of cinnamon, for inſtance, is exceſſively pungent and fiery; in its undiluted ſtate it is almoſt cauſtic; whereas cloves, a ſpice which in ſubſtance is far more pungent than the other, yields an oil which is far leſs ſo. This difference ſeems to depend partly upon the quantity of oil afforded, cinnamon yielding much leſs than cloves, and conſequently having its active matter concentrated into a ſmaller volume; partly, upon a difference in the nature of the active parts themſelves: for though volatile oils contain always the ſpecific odour and flavour of their ſubjects, whether grateful or ungrateful, they do not always contain the whole pungency: this reſides frequently in a more fixed matter, and does not riſe with the oil. After the diſtillation of cloves, pepper, and ſome other ſpices, a part of their pungency is found to remain behind: a ſimple tincture of them in rectified ſpirit of wine is even more pungent than their pure eſſential oils.

The more grateful oils are frequently made uſe of for reconciling to the ſtomach medicines of themſelves diſguſtful. It has been cuſtomary to employ them as correctors for the reſinous purgatives; an uſe which they do not ſeem to be well adapted to. All the ſervice they can here be of, is, to make the reſin ſit more eaſily at firſt on the ſtomach: far from abating the irritating quality upon which the violence of its operation depends, theſe pungent oils ſuperadd a freſh ſtimulus.

Volatile oils are never given alone, on account of their extreme heat and pungency; which in ſome is ſo great, that a ſingle drop let fall upon the tongue, produces a gangrenous eſchar. They are readily imbibed by pure dry ſugar, and in this form may be conveniently exhibited. Ground with eight or ten times their weight of ſugar, they become ſoluble in aqueous liquors, and thus may be diluted to any aſſigned degree. Mucilages alſo render them miſcible with water into an uniform milky liquor. They diſſolve likewiſe in ſpirit of wine; the more fragrant in an equal weight, and almoſt all of them in leſs than four times their own quantity. Theſe ſolutions may be either taken on ſugar, or mixed with ſyrups, or the like. On mixing them with water, the liquor grows milky, and the oil ſeparates.

The more pungent oils are employed externally againſt paralytic complaints, numbneſs, pains, and aches, cold tumours, and in other caſes where particular parts require to be heated or ſtimulated. The toothach is ſometimes relieved by a drop of theſe almoſt cauſtic oils, received on cotton, and cautiouſly introduced into the hollow tooth.

CHAP. XXI.

EMPYREUMATIC VOLATILE OILS.

Empyreumatic Oils agree in many particulars with the volatile oils already treated of, but they alſo differ from them in ſeveral important circumſtances. The latter exiſt ready formed in the aromatic ſubſtances, from which they are obtained, and are only ſeparated from the fixed principles by the action of a heat not exceeding that of boiling water. The former, on the contrary, are always formed by the action of a degree of heat conſiderably higher than that of boiling water, and are the product of decompoſition, and a new arrangement of the elementary principles of ſubſtances, containing at leaſt oxygen, hydrogen, and carbon. Their production is therefore always attended with the formation of other new products. In their chemical properties they do not differ very remarkably from the volatile oils, and are principally diftinguiſhed from them by their unpleaſant pungent empyreumatic ſmell and rough bitteriſh taſte. They are alſo more apt to ſpoil by the contact of the air, and the oftener they are re-diſtilled they become more limpid, leſs coloured, and more ſoluble in alcohol; whereas the eſſential oils, by repeated diſtillations, become thicker and leſs ſoluble in alcohol.

Their action on the body is exceedingly ſtimulant and heating.

OLEUM PETROLEI. *Lond.*
Oil of Petroleum.

Diſtil petroleum in a ſand bath.

The oil obtained from this bitumen will be more or leſs thin according to the continuance of the diſtillation; and by its continuance the tar will at laſt be reduced to a black coal; and then the oil will be pretty deep in colour, but perfectly fluid, though very acrid and ſtimulating.

It is leſs diſagreeable than ſome of the other empyreumatic oils which had formerly a place in our pharmacopœias, ſuch as the oleum lateritium.

OLEUM SUCCINI PURISSIMUM. *Edin.*
Purified Oil of Amber.

Diſtil oil of amber in a glaſs retort with ſix times its quantity of water till two thirds of the water have paſſed into the receiver; then ſeparate this very pure volatile oil from the water, and keep it for uſe in cloſe ſhut veſſels.

Oleum Succini Rectificatum. *Lond.*
Rectified Oil of Amber.

Take of
Oil of amber, one pound.
Diſtil three times.

Dub.

Take of
The oil which riſes in the preparation of ſalt of amber, three pounds.
Diſtil a pound and a half.

The rectified oil has a ſtrong bituminous ſmell, and a pungent acrid taſte. Given in a doſe of ten or twelve drops, it heats, ſtimulates, and promotes the fluid ſecretions: it is chiefly celebrated in hyſterical diſorders, and in deficiencies of the uterine purgations. Sometimes it is uſed externally, in liniments for weak or paralytic limbs, and rheumatic pains.

Off. prep.—Spt. am. ſuccin. *Lond.*

MOSCHUS ARTIFICIALIS.
Artificial Muſk.

BY treating one part of oil of amber with four of nitrous acid, added in ſmall portions at a time, and ſtirring them together with a glaſs rod, the oil is at laſt converted into a yellow reſin, having the ſmell of muſk, and known in Germany by the name of Artificial muſk, where it is often uſed as a ſubſtitute for that expenſive drug.

OLEUM ANIMALE. *Lond.*
Animal Oil.

Take of
Oil of hartſhorn, one pound.
Diſtil three times.

OLEUM CORNU CERVINI RECTIFICATUM. *Dub.*
Rectified Oil of Hartſhorn.

Take of
The oil which aſcends in the diſtillation of the volatile liquor of hartſhorn, three pounds.
Water, ſix pounds.
Diſtil a pound and a half.

ANIMAL OIL, thus rectified, is thin and limpid, of a ſubtle, penetrating, not diſagreeable, ſmell and taſte.

Medical uſe.—It is ſtrongly recommended as an anodyne and antiſpaſmodic in doſes of from 15 to 30 drops. Hoffmann reports, that it procures a calm and ſweet ſleep, which continues often for 20 hours, without being followed by any languor or debility, but rather leaving the patient more alert and cheerful than before: that it procures likewiſe a gentle ſweat, without increaſing the heat of the blood: that given to 20 drops or more, on an empty ſtomach ſix hours before the acceſſion of an intermittent fever, it frequently removes the diſorder; and that it is likewiſe a very general remedy in inveterate and chronical epilepſies, and in convulſive motions, eſpecially if given before the uſual time of the attack, and preceded by proper evacuations. How far empyreumatic oils poſſeſs the virtues that have been aſcribed to them, has not yet been ſufficiently determined by experience; the tedioufneſs and trouble of the rectification having prevented their coming into general uſe, or being often made. They are liable alſo to more material inconvenience in regard to their medicinal uſe, namely, precariouſneſs in their quality; for how perfectly ſoever they may be rectified, they gradually loſe, in keeping, the qualities they had received from that proceſs, and return more and more towards their original fetid ſtate.

CHAP. XXII.

DISTILLED SPIRITS.

The flavour and virtues of diſtilled waters are owing, as obſerved in the preceding chapter, to their being impregnated with a portion of the eſſential oil of the ſubject from which they are drawn. Alcohol, conſidered as a vehicle for theſe oils, has this advantage above water, that it keeps all the oil that riſes with it perfectly diſſolved into an uniform limpid liquor.

Neverthelefs, many ſubſtances, which, on being diſtilled with water, impart to it their virtues in great perfection; if treated in the ſame manner with alcohol, ſcarcely give over to it any ſmell or taſte. The cauſe of this difference is, that alcohol is not ſuſceptible of ſo great a degree of heat as water. It is obvious therefore, that ſubſtances may be volatile enough to riſe with the heat of boiling water, but not with that of boiling alcohol.

Thus, if cinnamon, for inſtance, be committed to diſtillation with a mixture of alcohol and water, or with a pure proof ſpirit, which is no other than a mixture of about equal parts of the two; the alcohol will ariſe firſt clear, colourleſs, and tranſparent, and almoſt without any taſte of the ſpice; but as ſoon as the more ponderous watery fluid begins to ariſe, the oil comes freely over with it, ſo as to render the liquor highly odorous, ſapid, and of a milky hue.

The proof ſpirits uſually met with in the ſhops are accompanied with a degree of ill flavour; which, though concealed by means of certain additions, plainly diſcovers itſelf in diſtillation. This nauſeous flavour does not begin to ariſe till after the purer ſpiritous part has come over; which is the very time that the virtues of the ingredients begin alſo to ariſe moſt plentifully; and hence the liquor receives an ungrateful taint. To this cauſe principally is owing the general complaint, that the cordials of the apothecary are leſs agreeable than thoſe of the ſame kind prepared by the diſtiller; the latter being extremely curious in rectifying or purifying the ſpirits (when deſigned for what he calls fine goods) from all unpleaſant flavour.

SPIRITUS CARI CARVI. *Edin.*

Spirit of Caraway.

Take of
Caraway ſeeds, half a pound;
Diluted alcohol, nine pounds.

Macerate two days in a cloſe veſſel; then pour on as much water as will prevent empyreuma, and draw off by diſtillation nine pounds.

SPIRITUS CARVI. *Lond. Dub.*

Spirit of Caraway.

Take of
Caraway ſeeds, bruiſed, half a pound;
Proof ſpirit of wine, one gallon; (nine pounds, *Dub.*)
Water, ſufficient to prevent empyreuma.

Draw off one gallon, (nine pounds, *Dub.*)

In the ſame manner is prepared the ſame quantity of ſpirit from

	SPIRITUS
CINNAMON, one pound,	*Lauri Cinnamomi.* Edin. *Cinnamomi.* Lond. Dub.
PEPPERMINT, one pound and a half,	*Menthæ Piperitæ.* Edin. ——— *Piperitidis.* Lond.
SPEARMINT, one pound and a half,	*Menthæ ſativæ.* Lond.
PENNYROYAL dried, a pound and a half,	*Pulegii.* Lond.
NUTMEG, well bruiſed, two ounces, *Off. prep.*—Succus coch. comp. *Ed.*	*Myriſticæ moſchatæ.* Edin. *Nucis moſchatæ.* Dub. Lond.
PIMENTO, half a pound,	*Myrti Pimentæ.* Edin. *Pimento.* Dub. Lond.

SPIRITUS LAVANDULÆ SPICÆ. *Ed.*

Spirit of Lavender.

Take of
Flowering ſpikes of lavender, freſh gathered, two pounds;

Alcohol, eight pounds.
Draw off by the heat of boiling water, ſeven pounds.

SPIRITUS LAVENDULÆ. *Lond. Dub.*
Spirit of Lavender.

Take of
Freſh flowers of lavender, one pound and a half;
Proof ſpirit of wine, one gallon, (nine pounds, *Dub.*)
Draw off by diſtillation in a water bath, five pints, (five pounds, *Dub.*)

Off. prep.—Spt. lav. comp. *Ed. Lond. Dub.* Linim camph. comp. *Lond. Dub.*

By theſe directions, and in the ſame quantities, are prepared,

SPIRITUS RORISMARINI OFFICINALIS. *Ed.* SPIRITUS RORISMARINI. *Lond.*
Spirit of Roſemary.

from two pounds of the flowering tops of roſemary, according to the Edinburgh college, and from a pound and a half according to the London.

Off. prep.—Linim ſapon. comp. *Lond.*

We think it unneceſſary to make particular obſervations on each of theſe ſimple ſpirits, as their virtues are the ſame with thoſe of the ſubſtances from which they are extracted, united to the ſtimulus of the alcohol. The alcohol in the ſpirits of lavender and roſemary, is almoſt pure; in the others it is diluted with about an equal weight of water.

SPIRITUS ANISI COMPOSITUS. *Lond.*
Compound Spirit of Aniſeed.

Take of
Aniſeed,
Angelica ſeed, of each, bruiſed, half a pound;
Proof ſpirit, one gallon;
Water, ſufficient to prevent empyreuma.
Draw off one gallon by diſtillation.

This compound ſpirit, like the ſimple ones, is an agreeable cordial; indeed too agreeable, for by ſome they are ſo often reſorted to, on the ſlighteſt ſenſation of flatulence in the ſtomach, that their uſe is attended with all the pernicious conſequences of dram drinking.

SPIRITUS JUNIPERI COMMUNIS COMPOSITUS. *Ed.*
SPIRITUS JUNIPERI COMPOSITUS. *Lond. Dub.*
Compound Spirit of Juniper.

Take of
Juniper berries, well bruiſed, one pound ;
Caraway ſeeds,
Sweet fennel ſeeds, each one ounce and a half ;
Diluted alcohol, nine pounds, (one gallon, *Lond.*)
Water, ſufficient to prevent empyreuma.
(Macerate two days, *Edin.*) Draw off nine pounds, (one gallon, *Lond.*)

THE good and bad effects of this ſpirit exactly coincide with thoſe of gin.

SPIRITUS RAPHANI COMPOSITUS. *Lond. Dub.*
Compound Spirit of Horſe-Radiſh.

Take of
Freſh horſe-radiſh root,
Dried outer rind of Seville oranges, each two pounds ;
Freſh herb of garden ſcury-graſs, four pounds ;
Bruiſed nutmegs, one ounce ;
Proof ſpirit, two gallons, (eighteen pounds, *Dub.*)
Water, ſufficient to prevent empyreuma.
Draw off two gallons, (eighteen pounds, *Dub.*)

ALTHOUGH this proceſs may furniſh an agreeable compound ſpirit, yet it is much to be doubted whether it poſſeſſes thoſe antiſcorbutic powers for which it was once celebrated.

SPIRITUS AMMONIÆ FŒTIDUS. *Lond.*
Fetid Spirit of Ammonia.

Take of
Proof ſpirit, ſix pints ;
Sal ammoniac, one pound ;
Aſſa fœtida, four ounces.
Potaſh, one pound and a half.
Mix them, and draw off by diſtillation five pints, with a ſlow fire.

ALCOHOL AMMONIATUM FŒTIDUM, SIVE SPIRITUS AMMONIÆ FOETIDUS. *Ed.* SPIRITUS ALCALI VOLATILIS FOETIDUS. *Dub.*
Fetid Spirit of Volatile Alkali.

Take of
Spirit of ammonia, eight ounces, (ten ounces, *Dub.*)

Aſſa fœtida, half an ounce.

Digeſt in a cloſe veſſel twelve hours; then diſtil off, with the heat of boiling water, eight ounces.

This ſpirit, the laſt formula of which is the beſt, as being moſt eaſily prepared, is deſigned as an anti-hyſteric, and is undoubtedly a very elegant one. Volatile ſpirits, impregnated for theſe purpoſes with different fetids, have been uſually kept in the ſhops; the ingredient here choſen, is the beſt calculated of any for general uſe, and equivalent in virtue to them all. The ſpirit is pale when newly diſtilled, but acquires a conſiderable tinge by keeping.

CHAP. XXIII.

INFUSIONS.

We have already explained the ſenſe in which we employ the term Infuſion. We confine it to the action of a menſtruum, not aſſiſted by ebullition, on any ſubſtance conſiſting of heterogeneous principles, ſome of which are ſoluble, and others inſoluble, in that menſtruum. The term is generally uſed in a more extenſive, but we are inclined to think, a leſs correct, ſenſe: thus, lime water and the mucilages, which are commonly claſſed with the infuſions, are inſtances of ſimple ſolution, and the chalk mixture is the mechanical ſuſpenſion of an inſoluble ſubſtance. When the menſtruum uſed is water, the ſolution is termed ſimply an Infuſion; but when the menſtrum is alcohol, it is called a Tincture; when wine or vinegar, a Medicated Wine or Vinegar. Infuſions in water are extremely apt to ſpoil, and are generally extemporaneous preparations.

INFUSUM CINCHONÆ OFFICINALIS. *Ed.*

Infuſion of Cinchona Bark.

Take of

Peruvian bark in powder, one ounce;

Water, one pound.

Macerate for twenty-four hours, and filter.

INFUSUM CORTICIS PERUVIANI. *Dub.*

Infuſion of Peruvian Bark.

Take of
- Peruvian bark, in coarſe powder, one ounce;
- Mucilage of gum-arabic, two ounces;
- Water, twelve ounces.

Triturate the bark with the mucilage, and add the water during the trituration. Macerate for twenty-four hours, and decant the pure liquor.

THIS is a very elegant form of exhibiting the active principles of cinchona bark, and that in which it will ſit lighteſt on weak and delicate ſtomachs. The trituration directed by the Dublin college will promote the ſolution, and the addition of the mucilage, will ſuſpend the fineſt particles of the ſubſtance of the bark itſelf. The reſiduum of the cold infuſion may be afterwards employed in making other preparations, eſpecially the extract, for its virtues are by no means exhauſted. But it muſt never be dried and ſold, or exhibited in ſubſtance, for that would be a culpable fraud.

INFUSUM DIGITALIS PURPUREÆ. *Ed.*

Infuſion of Foxglove.

Take of
- Dried leaves of foxglove, one drachm;
- Boiling water, eight ounces;
- Spirit of cinnamon, one ounce.

Macerate for four hours, and filter.

THIS is the infuſion ſo highly recommended by Withering. Half an ounce, or an ounce, of it, may be taken twice a-day in dropſical complaints. The ſpirit of cinnamon is added to improve its flavour, and to counteract its ſedative effects.

INFUSUM GENTIANÆ LUTEÆ COMPOSITUM; vulgo, INFUSUM AMARUM. *Ed.*

Compound Infuſion of Gentian, or Bitter Infuſion.

Take of
- Gentian root, half an ounce;
- Dried peel of Seville oranges, one drachm;
- Coriander ſeeds, half a drachm;
- Diluted alcohol, four ounces;
- Water, one pound.

Firſt pour on the alcohol, and three hours thereafter add the water; then macerate without heat for twelve hours, and ſtrain.

INFUSUM GENTIANÆ COMPOSITUM. *Lond.*
Compound Infuſion of Gentian.

Take of
The root of gentian cut into pieces, one drachm;
Dried orange-peel, a drachm and a half;
Freſh outer rind of lemons, half an ounce;
Boiling water, twelve ounces by meaſure.
Macerate for an hour, and ſtrain.

Dub.

Take of
Bruiſed gentian root, two drachms;
Freſh outer rind of lemons, half an ounce;
Dried peel of Seville oranges, a drachm and a half;
Diluted alcohol, four ounces;
Boiling water, twelve ounces.
Firſt pour on the ſpirit, and after three hours, the water. Laſtly, after macerating two hours, filter.

THESE formulæ do not differ materially. The Edinburgh college employ the largeſt proportion of gentian; but they infuſe it in cold water, which does not extract the bitter principle ſo quickly or ſo fully as boiling water, although it diſſipates leſs of the flavour of the aromatics. The alcohol is a uſeful addition, both in promoting the extraction of the virtues of all the ingredients, and in preſerving the infuſion longer from ſpoiling. This infuſion is an extremely good bitter, and is of great ſervice in all caſes where bitters in general are neceſſary. It ſtrengthens the ſtomach, and increaſes the appetite; beſides acting as a tonic on the other parts of the body, and on the vaſcular ſyſtem.

INFUSUM MIMOSÆ CATECHU; vulgo, INFUSUM JAPONICUM. *Ed.*
Infuſion of Catechu, commonly called *Japonic Infuſion.*

Take of
Extract of catechu, two drachms and a half;
Cinnamon, half a drachm;
Boiling water, ſeven ounces;
Simple ſyrup, one ounce.

Macerate the extract and cinnamon in the hot water, in a covered veſſel, for two hours, then ſtrain it, and add the ſyrup.

Extract of catechu is almoſt pure tanin. This infuſion is therefore a powerfully aſtringent ſolution. The cinnamon and ſyrup render it a very agreeable medicine, which will be found ſerviceable in fluxes proceeding from a laxity of the inteſtines. Its doſe is a ſpoonful or two every other hour. As this preparation will not keep above a day or two, it muſt always be made extemporaneouſly. The two hours maceration, therefore, becomes very often extremely inconvenient; but it may be prepared in a few minutes by boiling, without in the leaſt impairing the virtues of the medicine.

INFUSUM RHEI PALMATI. *Ed.*

Infuſion of Rhubarb.

Take of
Rhubarb, half an ounce;
Boiling water, eight ounces;
Spirit of cinnamon, one ounce.

Macerate the rhubarb in a cloſe veſſel with the water, for twelve hours; then having added the ſpirit, ſtrain the liquor.

This appears to be one of the beſt preparations of rhubarb, when deſigned as a purgative; water extracting its virtue more effectually than either vinous or ſpiritous menſtrua.

INFUSUM ROSÆ GALLICÆ. *Ed.*

Infuſion of Roſes.

Take of
The petals of red roſes, dried, one ounce;
Boiling water, five pounds;
Sulphuric acid, one drachm;
White ſugar, two ounces.

Macerate the petals with the boiling water in an earthen veſſel, which is not glazed with lead, for four hours; then having poured on the acid, ſtrain the liquor, and add the ſugar.

INFUSUM ROSÆ. *Lond.*

Infuſion of Roſes.

Take of
Dried red roſes, half an ounce;
Diluted vitriolic acid, three drachms;
Boiling diſtilled water, two pints and a half;

Double refined ſugar, one ounce and a half.

Firſt pour the water on the petals in a glaſs veſſel, then add the diluted vitriolic acid, and macerate for half an hour. Strain the liquor, when cold, and add the ſugar.

INFUSUM ROSARUM; olim, TINCTURA ROSARUM. *Dub.*
Infuſion of Roſes, formerly *Tincture of Roſes.*

Take of

The petals of red roſe buds, half an ounce;
Diluted vitriolic acid, three drachms;
Boiling water, three pounds;
Double refined ſugar, an ounce and a half.

Firſt mix the acid with the water in a glaſs or glazed earthen veſſel. Macerate the petals in the mixture, then add the ſugar to the liquor when cold and ſtrained.

THE difference in the directions for preparing this infuſion are immaterial. In fact, the roſe leaves have very little effect, except in giving the mixture an elegant red colour. Its ſub-acid and aſtringent virtues depend entirely on the ſulphuric acid. Altogether, however, it is an elegant medicine, and forms a very grateful addition to juleps in hæmorrhagies, and in all caſes which require mild coolers and ſub-aſtringents: it is ſometimes taken with boluſes or electuaries of the bark, and likewiſe makes a good gargle.

INFUSUM SENNÆ SIMPLEX. *Lond.*
Simple Infuſion of Senna.

Take of

Senna, an ounce and a half;
Ginger, powdered, one drachm;
Boiling diſtilled water, one pint.

Macerate them for an hour, in a covered veſſel; and ſtrain the liquor when cold.

INFUSUM SENNÆ. *Dub.*
Infuſion of Senna.

Take of

Senna, ſix drachms;
Ginger, powdered, half a drachm;
Boiling water, ten ounces.

Macerate them for an hour in a covered veſſel, then filter.

THIS is a very elegant infuſion of ſenna, the ginger acting as an uſeful corrigent. But if the ſenna were employed to the quantity of a drachm and a half, or two drachms only, in place of the quantity here ordered, it would be more convenient, as it is of advantage that it ſhould be uſed freſh as here prepared. Of the preſent infuſion, an ounce or two is a ſufficient doſe.

INFUSUM SENNÆ TARTARISATUM. *Lond.*

Tartariſed Infuſion of Senna.

Take of
- Senna, one ounce and a half;
- Coriander ſeeds, bruiſed, half an ounce;
- Cryſtals of tartar, two drachms;
- Diſtilled water, one pint.

Diſſolve the cryſtals of tartar by boiling in the water; then pour the liquor, as yet boiling, on the ſenna and ſeeds. Macerate for an hour in a covered veſſel, and ſtrain when cold.

The addition of the ſuper-tartrate of potaſs renders the taſte of the ſenna leſs unpleaſant, and alſo promotes its action.

INFUSUM TAMARINDI INDICI CUM CASSIA SENNA. *Edin.*

Infuſion of Tamarinds and Senna.

Take of
- Preſerved tamarinds, one ounce;
- Senna, one drachm;
- Coriander ſeeds, half a drachm;
- Brown ſugar, half an ounce;
- Boiling water, eight ounces.

Macerate them for four hours, occaſionally agitating them, in a cloſe earthen veſſel, not glazed with lead, and ſtrain the liquor.

It may alſo be made with double, triple, &c. the quantity of ſenna.

This forms a mild and uſeful purge, excellently ſuited for delicate ſtomachs, and inflammatory diſeaſes. The taſte of the ſenna is well covered by the aromatic ſugar and by the acidity of the tamarinds.

CHAP. XXIV.

DECOCTIONS.

Decoctions differ from infuſions only in the action of the menſtruum being aſſiſted by a boiling heat. At the ſame time, however, that the increaſe of temperature facilitates and expedites the ſolution of ſome fixed principles, it gives others a tendency to decompoſition, and diſſipates all volatile matters. Decoction, therefore, can only be uſed with advantage for the extraction of principles which are neither volatilized nor altered by a boiling heat.

To promote the action of the menſtruum, infuſion is ſometimes premiſed to decoction.

In compound decoctions it is ſometimes convenient not to put in all the ingredients from the firſt, but in ſucceſſion, according to their hardneſs, and the difficulty with which their virtues are extracted; and if any aromatic, or other ſubſtances containing volatile principles, enter into the compoſition, the boiling decoction is to be ſimply poured upon them, and covered up until it cool.

Decoctions ſhould be made in veſſels ſufficiently large to prevent any riſk of boiling over, and ſhould be continued without interruption, and gently.

DECOCTUM ALTHÆÆ OFFICINALIS. *Ed.*

Decoction of Marſhmallows.

Take of
  Dried marſhmallow roots, four ounces;
  Raiſins of the ſun, ſtoned, two ounces;
  Water, ſeven pounds.
Boil to five pounds; place apart the ſtrained liquor till the feces have ſubſided, then pour off the clear liquor.

MARSHMALLOW roots contain nothing ſoluble in water except mucilage, which is very abundant in them. This decoction is therefore to be conſidered merely as an emollient, rendered more pleaſant by the acidulous ſweetneſs of the raiſins.

DECOCTUM ANTHEMIDIS NOBILIS; vulgo, DECOCTUM CHAMÆMELI ſive COMMUNE. *Edin.*

Common Decoction, or Decoction of Chamomile.

Take of
  Chamomile flowers, dried, one ounce;
  Caraway ſeeds, half an ounce;
  Water, five pounds.
Boil a quarter of an hour, and ſtrain.

DECOCTUM CHAMÆMELI; ſive, DECOCTUM PRO ENEMATE. *Dub.*

Decoction of Chamomile, or Decoction for Glyſters.

Take of
  Chamomile flowers, dried, half an ounce;

Sweet fennel ſeeds, two drachms;
Water, a pound.
Boil a little, and ſtrain.

DECOCTUM PRO ENEMATE. *Lond.*
Decoction for Clyſters.

Take of
The leaves of mallow, dried, one ounce;
Chamomile flowers, dried, half an ounce;
Water, one pint.
Boil, and ſtrain.

DECOCTUM PRO FOMENTO. *Lond.*
Decoction for Fomentations.

Take of
The leaves of ſouthernwood, dried,
The tops of ſea wormwood, dried,
Chamomile flowers, dried, each one ounce;
Bay leaves, dried, half an ounce;
Diſtilled water, ſix pints.
Boil them a little, and ſtrain.

THESE decoctions are merely ſolutions of bitter extractive, combined, in the ſecond with mucilage, and in the others with eſſential oils. In making them, the aromatic ſubſtances ſhould not be added until the decoction is nearly completed; for otherwiſe their flavour would be entirely diſſipated.

It muſt, however, be acknowledged, that theſe impregnations are for the moſt part unneceſſary for the purpoſe of glyſters; and in ordinary caſes, the bulk and warmth produce a diſcharge before theſe medicines can have any effect.

As fomentations, their virtues are alſo in a great meaſure to be aſcribed to the influence of the warm water: and when the herbs themſelves are applied, they act only as retaining heat and moiſture for a longer time.

DECOCTUM CINCHONÆ OFFICINALIS; vulgo, DECOCTUM CORTICIS PERUVIANI. *Edin.*
Decoction of Cinchona Bark.

Take of
Cinchona bark, in powder, one ounce;
Water, a pound and a half.
Boil for ten minutes in a covered veſſel, and ſtrain the liquor while hot.

DECOCTUM CORTICIS PERUVIANI. *Lond.*
Decoction of Peruvian Bark.

Take of
  Peruvian bark, powdered, one ounce;
  Diſtilled water, one pint and three ounces.

Boil for ten minutes in a covered veſſel, and ſtrain the liquor while hot.

Dub.

Take of
  Peruvian bark, in coarſe powder, ſix drachms;
  Water, eighteen ounces.

Boil for ten minutes in a veſſel almoſt covered, and ſtrain the liquor, while hot, through linen.

CINCHONA bark readily yields its active principles to the action of boiling water, and in greater quantity than cold water is capable of retaining diſſolved; therefore, when a ſaturated decoction cools, it becomes turbid, and there is always a depoſition of a yellowiſh or reddiſh powder, while the ſupernatant liquor is reduced to the ſtrength of a ſaturated cold infuſion. Decoction therefore preſents us with an eaſy means of obtaining immediately an active preparation of cinchona bark, and with one of greater ſtrength than a cold or even a warm infuſion, provided it be drunk while tepid, and before it forms any depoſition, or if the precipitate be diffuſed by agitation, after it is formed. As the precipitate contains no woody fibre, or other inert matter, it is extremely probable that in very ſmall doſes it would prove, if dried, a very powerful preparation of cinchona bark.

Formerly it was ſuppoſed that the ſtrength of a decoction of cinchona bark, and ſimilar ſubſtances, was increaſed by continuing the boiling for a great length of time; but this is now known to be a miſtake; and indeed, after a certain time, the decoction becomes weaker inſtead of ſtronger, becauſe water at different temperatures is capable of diſſolving only a determinate proportion of its active principles; and therefore, as ſoon as it is ſaturated, any farther decoction is unneceſſary. But moreover, theſe principles, when diſſolved in water, are liable to be decompoſed and become inert, by the abſorption of atmoſpheric oxygen, and this decompoſition is increaſed by increaſe of temperature; and as boiling conſtantly preſents new ſurfaces to the action of the air, it is evidently hurtful when protracted longer than what is juſt neceſſary to ſaturate the water. Ten minutes is ſuppoſed by the colleges to be ſufficient for that purpoſe.

DECOCTUM DAPHNES MEZEREI. *Ed.*

Decoction of Mezereon.

Take of
- The bark of Mezereon root, two drachms;
- Liquorice root, bruiſed, half an ounce;
- Water, three pounds.

Boil it, with a gentle heat, down to two pounds, and ſtrain it.

From four to eight ounces of this decoction may be given four times a-day, in ſome obſtinate venereal and rheumatic affections. It operates chiefly by perſpiration.

DECOCTUM GEOFFRÆÆ INERMIS. *Ed.*

Decoction of Cabbage-tree Bark.

Take of
- Bark of the cabbage tree, powdered, one ounce;
- Water, two pounds.

Boil it with a gentle fire down to one pound, and ſtrain.

This is a powerful anthelmintic. It may be given in doſes of one table ſpoonful to children, and four to adults. If diſagreeable ſymptoms ſhould ariſe from an over-doſe, or from drinking cold water during its action, we muſt immediately purge with caſtor oil, and dilute with acidulated drinks.

DECOCTUM GUAIACI OFFICINALIS COMPOSITUM; vulgo, Decoctum Lignorum. *Ed.*

Compound Decoction of Guaiacum, commonly called *Decoction of the Woods.*

Take of
- Guaiacum raſpings, three ounces;
- Raiſins, ſtoned, two ounces;
- Saſſafras root,
- Liquorice, each one ounce;
- Water, ten pounds.

Boil the guaiacum and raiſins with the water, over a gentle fire, to the conſumption of one half; adding, towards the end, the ſaſſafras and liquorice. Strain the liquorice, without expreſſion.

This decoction is of uſe in ſome rheumatic and cutaneous affections. It may be taken by itſelf, to the quantity of a quarter of a pint twice or thrice a-day, or uſed as an aſſiſtant in a courſe of mercurial or antimonial alteratives; the patient, in either caſe, keeping warm, in order to promote the operation of the medicine.

DECOCTUM HELLEBORI ALBI. *Lond.*

Decoction of White Hellebore.

Take of

The root of white hellebore, powdered, one ounce;
Diſtilled water, two pints;
Rectified ſpirit of wine, two ounces.

Boil the water with the root to one pint, and, the liquor being cold and ſtrained, add to it the ſpirit.

THIS decoction is only uſed externally as a waſh, in tinea capitis, lepra, pſora, &c. When the ſkin is very tender and irritable, it ſhould be diluted with an equal quantity of water.

DECOCTUM HORDEI DISTICHI. *Ed.* DECOCTUM HORDEI. *Lond.*

Decoction of Barley. Barley Water.

Take of

Pearl barley, two ounces;
Water, five pounds.

Firſt waſh the barley, from the mealy matter that adheres to it, with ſome cold water; then boil it a little with about half a pound of water, to extract the colouring matter. Throw this away; and put the barley thus purified into five pounds of boiling water, which is to be boiled down to one half, and ſtrained.

DECOCTUM HORDEI COMPOSITUM. *Lond.*

Compound Decoction of Barley.

Take of

The decoction of barley, two pints;
Figs, ſliced, two ounces;
Liquorice root, ſliced and bruiſed, half an ounce;
Raiſins, ſtoned, two ounces;
Diſtilled water, one pint.

Boil to two pints, and ſtrain.

THESE liquors are to be uſed freely, as diluting drinks, in fevers and other acute diſorders: hence it is of conſequence that they ſhould be prepared ſo as to be as elegant and agreeable as poſſible: for this reaſon they are inſerted in the pharmacopœia, and the ſeveral circumſtances which contribute to their elegance ſet down: if any one of them be omitted, the beverage will be leſs grateful. However trivial medicines of this claſs may appear to be, they are of greater importance in the cure of acute diſeaſes than many more elaborate preparations.

Barley water, however, is much more frequently prepared by nurſes than apothecaries, particularly in its ſimple ſtate.

DECOCTUM POLYGALÆ SENEGÆ. *Ed.*
Decoction of Seneka.

Take of
Seneka root, one ounce;
Water, two pounds.
Boil to ſixteen ounces, and ſtrain.

THE virtues of this decoction will be eaſily underſtood from thoſe of the root from which it is prepared. The doſe in hydropic caſes, and rheumatic or arthritic complaints, is two ounces, three or four times a-day, according to its effect.

DECOCTUM SMILACIS SARSAPARILLÆ. *Ed.* DECOCTUM SARSAPARILLÆ. *Lond. Dub.*
Decoction of Sarſaparilla.

Take of
The root of ſarſaparilla, ſliced, ſix ounces;
Diſtilled water, eight pints.
Macerate for two hours, with a heat of about 195°; then take out the root, and bruiſe it; return the bruiſed root to the liquor, and again macerate it for two hours. Then, the liquor being boiled to the meaſure of four pints, preſs it out, and ſtrain.

THE above formula is that of the London college; and as that of the Edinburgh college differs from it only in omitting the ſecond maceration, and that of the Dublin in not expreſſing the temperature in which it is to be performed, it was thought unneceſſary to introduce them. It is indeed a very doubtful remedy, and its diaphoretic effects are probably owing to its being drunk warm. It is totally incapable of curing ſyphilis; but by ſome it is thought uſeful in the ſequelæ of that diſeaſe.

DECOCTUM SARSAPARILLÆ COMPOSITUM. *Lond. Dub.*
Compound Decoction of Sarſaparilla.

Take of
The root of ſarſaparilla, ſliced and bruiſed, ſix ounces;
Bark of the root of ſaſſafras,
Shavings of guaiacum wood,
Liquorice root, bruiſed, of each one ounce;
Mezereon, three drachms;
Diſtilled water, ten pints.
Macerate, with a gentle heat, for ſix hours; then boil it down to

five pints, adding, towards the end of the boiling, the mezereon, and ſtrain the liquor.

The directions of the Dublin college only differ in adding the liquorice root along with the mezereon, and in reducing the quantity of the ingredients uſed to one fourth part.

This compound decoction is an elegant mode of preparing an article once highly celebrated under the title of the Liſbon diet drink, which, for a long time after its firſt introduction into Britain, was kept a ſecret; but an account of the method of preparing it was at length publiſhed in the phyſical and literary Eſſays of Edinburgh, by Dr. Donald Monro.

It operates as a diaphoretic, and may be given with advantage in rheumatic caſes, and in ſome of the ſequelæ of ſyphilis. Three or four ounces may be taken four times a-day.

DECOCTUM ULMI. *Lond.*

Decoction of Elm.

Take of
 The freſh inner bark of elm, bruiſed, four ounces;
 Diſtilled water, four pints.
Boil to two pints, and ſtrain.

It has been chiefly, if not entirely, under this form of decoction, that the elm bark has been employed for combating thoſe cutaneous eruptions, againſt which it has of late been ſo highly celebrated. Any experience which we have had of it, however, in actual practice, by no means confirms the very favourable account which ſome have given of its uſe.

CHAP. XXV.

MUCILAGES.

MUCILAGO AMYLI. *Ed. Lond.*

Mucilage of Starch.

Take of
 Starch, half an ounce;
 Water, one pound.
Triturate the ſtarch, gradually adding the water; then boil them a little.

The London college uſe only three drachms of ſtarch to one pound of water. The mucilage thus formed is very uſeful in thoſe caſes where a glutinous ſubſtance is required; it is often ſucceſsfully employed as a glyſter, in diarrhœas depending on acrimony in the inteſtines.

MUCILAGO ASTRAGALI TRAGACANTHÆ. *Ed.*

Mucilage of Gum Tragacanth.

Take of
  Gum tragacanth, in powder, one ounce;
  Boiling water, eight ounces.

Macerate twenty-four hours; then triturate them carefully, that the gum may be diſſolved; and preſs the mucilage through linen cloth.

MUCILAGO TRAGACANTHÆ. *Lond.*

Mucilage of Tragacanth.

Take of
  Tragacanth, half an ounce;
  Diſtilled water, ten ounces, by meaſure.

Macerate them, with a gentle heat, till the tragacanth be diſſolved.

MUCILAGO GUMMI TRAGACANTHÆ. *Dub.*

Mucilage of Tragacanth.

Takeo
  Gum tragacanth, in powder, one drachm;
  Boiling water, eight ounces.

Diſſolve the gum by digeſtion; then ſtrain the mucilage through linen.

GUM TRAGACANTH is difficultly ſoluble in water. When macerated in it, it ſwells, but does not diſſolve. To effect the ſolution it muſt be beaten into a paſte with ſome of the water; and the reſt of the water muſt be added gradually, and incorporated with the paſte by beating them together. Gum tragacanth is a very tenacious ſubſtance, and requires a very large proportion of water to form a fluid mucilage. That of the Edinburgh college, which is made with eight parts of water, is a paſte rather than a mucilage. The London mucilage is made with twenty parts of water, and the Dublin with ſixty-four.

MUCILAGO MIMOSÆ NILOTICÆ. *Ed.*

Mucilage of Gum Arabic.

Take of
  Gum Arabic, in powder, one part;
  Boiling water, two parts.

Digeſt, with frequent agitation, until the gum be diſſolved; then preſs the mucilage through linen.

MUCILAGO ARABICI GUMMI. *Lond.*
Mucilage of Gum-Arabic.

Take of
Gum Arabic, in powder, four ounces;
Boiling diſtilled water, eight ounces.
Triturate the gum with the water until it be diſſolved.

Dub.

Take of
Gum Arabic, in powder, four ounces;
Boiling water, nine ounces.
Triturate the gum with the water, then preſs the mucilage through linen.

It is very neceſſary to paſs the mucilage through linen, in order to free it from pieces of wood and other impurities, which always adhere to the gum: the linen may be placed in a funnel.

Mucilage of gum arabic is very uſeful in many operations in pharmacy; it is alſo much uſed for properties peculiar to thoſe ſubſtances of its own claſs, and of all the gums it ſeems to be the pureſt.

Off. prep.—Inf. cort. Peruv. *Dub.* Emulſio Arabica. *Edin.* Potio carb. calcis. *Ed.*

MUCILAGO SEMINUM CYDONII MALI. *Lond.*
Mucilage of Quince-Seed.

Take of
Quince-ſeeds, one drachm;
Diſtilled water, eight ounces, by meaſure.
Boil with a ſlow fire for ten minutes; then paſs it through linen.

This mucilage, though ſufficiently agreeable, is perfectly ſuperfluous, eſpecially as it is apt to ſpoil, from being mixed with the other principles of the ſeeds ſoluble in water. It is beſides never ſo tranſparent as mucilage carefully prepared from gum arabic, is not cheaper, and is unfit for many purpoſes, being coagulated by acids.

CHAP. XXVI.

SYRUPS.

SYRUPI. *Lond.* *Dub.*
Syrups.

In making ſyrups, where we have not directed either the weight of the ſugar, or the manner in which it ſhould be diſſolved, this is to be the rule:

Take of

Double refined ſugar, twenty-nine ounces ;

Any kind of liquor, one pint, (one pint and a half, *Dub.*)

Diſſolve the ſugar in the liquor, in a water bath ; (mix and boil down to one pound, *Dub.*) then ſet it aſide for twenty-four hours ; take off the ſcum, and pour off the ſyrup from the feces if there be any.

Syrups are ſolutions of ſugar in any watery fluid, whether ſimple or medicated. Simple ſyrup is nutritious and demulcent. When made of fine ſugar, it is tranſparent and colourleſs. If neceſſary, it is eaſily clarified, by beating to a froth the white of an egg with three or four ounces of water, mixing it with the ſyrup, and boiling the mixture for a few ſeconds, until the albumen coagulates, and enveloping all heterogeneous matters, it forms a ſcum, which may be eaſily taken off, or ſeparated by filtration. When inſtead of ſimple water, any other fluid is uſed for diſſolving the ſugar, the ſyrup is then medicated. Medicated ſyrups are prepared, either with expreſſed juices, infuſions, decoctions, or ſaline fluids. The object of forming theſe into ſyrups, is either to render them agreeable to the palate, or to preſerve them from fermentation. In the latter caſe, the quantity of ſugar added becomes a matter of great importance ; for, if too much be employed, the ſugar will ſeparate by cryſtallization ; and if too little, inſtead of preventing fermentation, it will accelerate it. About two parts of ſugar to one of fluid are the proportions directed by the Britiſh colleges with this view. But, as in ſome inſtances, a larger quantity of fluid is added, and afterwards reduced to the proper quantity by decoction, it will not be ſuperfluous to point out ſome circumſtances, which ſhew the evaporation to have been carried far enough. Theſe are the tendency to form a pellicle on its ſurface, when a drop of it is allowed to cool, the receding of the laſt portion of each drop, when poured out drop by drop, after it is cold, and, what is moſt to be relied on, its ſpecific gravity when boiling hot, being about 1.385, or 1.3, when cold. The ſyrup which remains, after all the cryſtallizable ſugar has been ſeparated from it, has been much, and probably juſtly, recommended by ſome for the preparation of medicated ſyrups and electuaries, although its pharmaceutical ſuperiority is actually owing to its impurity.

SYRUPUS SIMPLEX, sive COMMUNIS. *Edin.*

Simple or *Common Syrup.*

Take of

Double refined ſugar, fifteen parts ;

Water, eight parts.

Let the ſugar be diſſolved by a gentle heat, and boiled a little, ſo as to form a ſyrup.

THIS peparation is a plain liquid ſweet, void of flavour or colour; and is more convenient in extemporaneous preſcription than ſugar undiſſolved.

SYRUPUS ACIDI ACETOSI. *Edin.*

Syrup of Acetous Acid.

Take of

Acetous acid, two pounds and a half;
Double refined ſugar, three pounds and a half.

Boil them ſo as to form ſyrup.

THIS is to be conſidered as ſimple ſyrup merely acidulated, and is by no means unpleaſant. It is often employed in mucilaginous mixtures, and the like: and, on account of its cheapneſs, it is often preferred to ſyrup of lemons.

SYRUPUS ALLII. *Dub.*

Syrup of Garlic.

Take of

Garlic, ſliced, one pound;
Double refined ſugar, four pounds;
Boiling water, two pounds.

Macerate the garlic in the water in a cloſe veſſel for twelve hours, and add the ſugar to the ſtrained liquor.

THIS is a very diſagreeable ſyrup; but when we wiſh to extract the virtues of garlic by a watery menſtruum, it is the beſt means we can employ.

SYRUPUS ALTHÆÆ OFFICINALIS. *Edin.*

Syrup of Marſhmallow.

Take of

Freſh marſhmallow roots, one pound;
Water, ten pounds;
Double refined ſugar, four pounds.

Boil the water with the roots to the conſumption of one half, and ſtrain the liquor, ſtrongly expreſſing it. Suffer the ſtrained liquor to reſt till the feces have ſubſided; and to the depurated liquor add the ſugar; then boil ſo as to make a ſyrup.

SYRUPUS ALTHÆÆ. *Lond.*
Syrup of Marſhmallow.

Take of
Freſh root of marſhmallow, bruiſed, one pound;
Double refined ſugar, four pounds;
Diſtilled water, one gallon.

Boil the water with the marſhmallow root to one half, and preſs out the liquor when cold. Set it by twelve hours; and, after the feces have ſubſided, pour off the liquor. Add the ſugar, and boil it to the weight of ſix pounds.

THIS is merely a mucilaginous ſyrup, and is chiefly uſed in nephritic caſes, for ſweetening emollient decoctions, and the like.

SYRUPUS AMOMI ZINGIBERIS. *Edin.*
Syrup of Ginger.

Take of
Beat ginger, three ounces;
Boiling water, four pounds;
Double refined ſugar, ſeven pounds and a half.

Macerate the ginger in the water in a cloſe veſſel, for twenty-four hours; then to the liquor ſtrained add the beat ſugar, ſo as to make a ſyrup.

SYRUPUS ZINGIBERIS. *Lond.*
Syrup of Ginger.

Take of
Ginger, bruiſed, four ounces;
Boiling diſtilled water, three pints.

Macerate for four hours, and ſtrain; then add double refined ſugar, and make into a ſyrup, according to the general preſcription.

THESE are agreeable and moderately aromatic ſyrups, impregnated with the flavour and virtues of the ginger.

Off. prep.—Elect. catechu, *Dub.* Elect. opiat. *Ed.* Pil aloes, *Lond.* Pil ſcill. *Lond. Dub.*

SYRUPUS CITRI AURANTII. *Edin.*
Syrup of Orange-Peel.

Take of
The freſh outer rind of Seville oranges, ſix ounces;
Boiling water, three pounds;
Double refined ſugar, four pounds.

Macerate the rind in the water for twelve hours; then add to the filtered liquor the ſugar, in powder, and apply a gentle heat, ſo as to form a ſyrup.

SYRUPUS CORTICIS AURANTII. *Lond. Dub.*
Syrup of Orange-Peel.

Take of
Freſh outer rind of Seville oranges, eight ounces;
Boiling diſtilled water, five pints.
Macerate, for twelve hours, in a cloſe veſſel; and, in the ſtrained liquor, diſſolve double-refined ſugar to make a ſyrup.

IN making this ſyrup, it is particularly neceſſary that the ſugar be previouſly powdered, and diſſolved in the infuſion with as gentle a heat as poſſible, to prevent the exhalation of the volatile parts of the peel. With theſe cautions, the ſyrup proves a very elegant and agreeable one, poſſeſſing a great ſhare of the fine flavour of the orange peel.

Off. prep.—Elect. aromat. *Ed. Dub.* Elect. catechu comp. *Dub.* Elect. ſcammon. *Dub.*

SYRUPUS CITRI MEDICI; olim, SYRUPUS LIMONUM. *Ed.*
SYRUPUS LIMONIS SUCCI. *Lond. Dub.*
Syrup of Lemons.

Take of
Juice of lemons, ſuffered to ſtand till the feces have ſubſided, and afterwards ſtrained, three parts, (two pints, *Lond.* two pounds, *Dub.*)
Double refined ſugar, five parts, (fifty ounces, *Lond.* four pounds, *Dub.*)
Diſſolve the ſugar in the juice, ſo as to make a ſyrup.

IN the ſame way are prepared,

SYRUPUS SUCCI FRUCTUS MORI.
Syrup of Mulberry-juice.

SYRUPUS SUCCI FRUCTUS RUBI IDÆI. *Lond.*
Syrup of Mulberry-juice.

SYRUPUS SUCCI FRUCTUS RIBIS NIGRI. *Lond.*
Syrup of Black Currant-juice.

ALL theſe are very pleaſant cooling ſyrups; and with this intention they are occaſionally uſed in draughts and juleps, for quenching thirſt, abating heat, &c. in bilious or inflammatory diſtempers. They are ſometimes likewiſe employed in gargariſms for inflammations of the mouth and tonſils.

SYRUPUS COLCHICI AUTUMNALIS. *Ed.*

Syrup of Colchicum.

Take of

Colchicum root, freſh and ſucculent, cut into ſmall pieces, one ounce;

Vinegar, ſixteen ounces;

Double refined ſugar, twenty-ſix ounces.

Macerate the root in the vinegar two days, now and then ſhaking the veſſel; then ſtrain it with a gentle preſſure. To the ſtrained liquor add the ſugar, and boil a little, ſo as to form a ſyrup.

This ſyrup ſeems to be the beſt preparation of the colchicum. We muſt take care to gather this root in the proper ſeaſon: and from errors in this particular we are to aſcribe the uncertainty in the effects of this medicine as found in the ſhops.

The ſyrup of colchicum is often ſucceſsfully employed as a diuretic, and may be taken from a drachm or two to the extent of an ounce or more.

SYRUPUS DIANTHI CARYOPHYLLI. *Edin.*

Syrup of Clove July-flower.

Take of

Clove July flowers, freſh gathered and freed from the heels, one pound;

Double-refined ſugar, ſeven pounds, *Ed.*

Boiling water, four pounds, *Ed.*

Macerate the petals in the water for twelve hours; then to the ſtrained liquor add the ſugar previouſly beat, and diſſolve it by a gentle heat, ſo as to form a ſyrup.

Syrupus Caryophylli Rubri. *Lond.*

Syrup of Clove July-flower.

Take of

Freſh clove July flowers, two pounds;

Boiling diſtilled water, ſix pints.

Macerate for twelve hours in a glaſs veſſel; and, in the ſtrained liquor diſſolve double refined ſugar, ſo as to form a ſyrup.

As the beauty of the colour is a principal quality in this ſyrup, no force in the way of expreſſion ſhould be uſed in ſeparating the liquor from the flowers.

Some have ſubſtituted to it one eaſily prepared at ſeaſons when the flowers are not to be procured: an ounce of clove ſpice is infuſed for ſome days in twelve ounces of white wine, the liquor ſtrained, and, with the addition of twenty ounces of ſugar, boiled to a proper conſiſtence: a little cochineal renders the colour of this ſyrup exactly ſimilar to that prepared from the clove July flower; and its flavour is of the ſame kind, though not ſo pleaſant. The counterfeit may be readily detected by adding to a little of the ſyrup ſome alkaline ſalt or ley; which will change the genuine ſyrup to a green colour; but in the counterfeit it will make no ſuch alteration, only varying the ſhade of the red.

SYRUPUS CROCI. *Lond.*

Syrup of Saffron.

Take of
  Saffron, one ounce;
  Boiling diſtilled water, one pint.

Macerate the ſaffron, in the water, for twelve hours, in a cloſe veſſel; and diſſolve double refined ſugar in the ſtrained liquor, that it may be made a ſyrup.

Saffron is very well fitted for making a ſyrup, as in this form a ſufficient doſe of it is contained in a reaſonable compaſs. This ſyrup is a pleaſant cordial, and gives a fine colour to juleps.

Off. prep.—Pil aloes cum myrrha, *Lond.* Pil galb. comp. *Lond.*

SYRUPUS MANNÆ. *Dub.*

Syrup of Manna.

Take of
  Manna,
  Double refined ſugar, each one pound;
  Senna, half an ounce;
  Boiling water, a pound.

Macerate the ſenna in the water, in a covered veſſel, for twelve hours; then, with the ſtrained liquor mix the manna and the ſugar, ſo that they may be diſſolved.

This ſyrup is a mild purgative, and well adapted to children and perſons of a delicate conſtitution.

SYRUPUS PAPAVERIS SOMNIFERI. *Ed.*

Syrup of White Poppies.

Take of
  White poppy-heads, dried, and freed from the ſeeds, two pounds;
  Boiling water, thirty pounds;
  Double refined ſugar, four pounds.

Macerate the ſliced heads in the water for twelve hours: next boil till only one third part of the liquor remain; then ſtrain it, by expreſſing it ſtrongly. Boil the ſtrained liquor to the conſumption of one half, and ſtrain again; laſtly, add the ſugar, and boil a little ſo as to form a ſyrup.

SYRUPUS PAPAVERIS ALBI. *Lond.*

Syrup of White Poppy.

Take of
  The heads of white poppies, dried, three pounds and a half;

Double refined ſugar, ſix pounds;
Diſtilled water, eight gallons.

Slice and bruiſe the heads, then boil them in the water, to three gallons, in a water bath, ſaturated with ſea-ſalt, and preſs out the decoction. Reduce this, by boiling, to about four pints, and ſtrain it while hot, through a ſieve, then through a thin woollen cloth, and ſet it aſide for twelve hours, that the feces may ſubſide. Boil the liquor, poured off from the feces, to three pints, and diſſolve the ſugar in it, that it may be made a ſyrup.

This ſyrup, impregnated with the opiate matter of the poppy heads, is given to children in doſes of two or three drachms; to adults, from half an ounce to an ounce and upwards, for eaſing pain, procuring reſt, and anſwering the other intentions of mild opiates. Particular care is requiſite in its preparation, that it may be always made, as nearly as poſſible, of the ſame ſtrength; and accordingly the colleges have been very minute in their deſcription of the proceſs.

Off. prep.—Confectio opiata, *Lond.*

SYRUPUS OPII. *Dub.*

Syrup of Opium.

Take of
Extract of opium, forty-eight grains;
Boiling water, three pounds.

Macerate until the opium be diſſolved, then add double refined ſugar, ſo as to make a ſyrup according to the general formula.

This ſyrup is an elegant ſubſtitute for the former. It is made with infinitely leſs trouble, and is always of an uniform ſtrength. It contains about two grains and a half of opium in the ounce.

SYRUPUS PAPAVERIS ERRATICI. *Lond.*

Syrup of Red Poppy.

Take of
The freſh flowers of the red poppy, four pounds;
Boiling diſtilled water, four pints and a half.

Put the flowers, by degrees, into the boiling water, in a water bath, conſtantly ſtirring them. After this, the veſſel being taken out of the bath, macerate for twelve hours; then preſs out the liquor, and ſet it apart, that the feces may ſubſide. Laſtly, make it into a ſyrup, with double refined ſugar.

The deſign of putting the flowers into boiling water in a water bath is, that they may be a little ſcalded, ſo as to ſhrink enough to be all immerged in the water; without this precaution they can ſcarce be all got in: but they are to be continued no longer over the fire than till this effect is produced, leſt the liquor become too thick, and the ſyrup be rendered ropy.

As a medicine it is perfectly inſignificant.

SYRUPUS RHAMNI CATHARTICI. *Edin.*

Syrup of Buckthorn.

Take of
The juice of ripe buckthorn berries, depurated, two parts;
Double refined ſugar, one part.
Boil them ſo as to form a ſyrup.

SYRUPUS SPINÆ CERVINÆ. *Lond.*

Syrup of Buckthorn.

Take of
The freſh juice of ripe buckthorn berries, one gallon;
Ginger, bruiſed, one ounce;
Pimento, powdered, one ounce and a half;
Double refined ſugar, ſeven pounds.

Set aſide the juice for three days, that the feces may ſubſide; and then ſtrain it. Macerate the ginger and pimento in a pint of the ſtrained juice for four hours, and ſtrain. Boil away the reſt of the juice to three pints; then add that part of the juice in which the ginger and pimento have been macerated, and form a ſyrup of it, with the ſugar.

Both theſe preparations, in doſes of three or four ſpoonfuls, operate as briſk cathartics. The principal inconveniences attending them are, their being very unpleaſant, and their occaſioning a thirſt and dryneſs of the mouth and fauces, and ſometimes violent gripes: theſe effects may be prevented by drinking liberally of water-gruel, or other warm liquids, during the operation.

SYRUPUS ROSÆ GALLICÆ. *Ed.*

Syrup of Red Roſes.

Take of
The dried petals of red roſes, ſeven ounces;
Double refined ſugar, ſix pounds;
Boiling water, five pounds.

Macerate the roſes in the water for twelve hours, then boil them a little and ſtrain the liquor, add to it the ſugar, boil them again for a little ſo as to form a ſyrup.

This ſyrup is ſuppoſed to be mildly aſtringent; but is principally valued on account of its red colour.

Off. prep.—Elect. catechu, *Ed.*

SYRUPUS ROSÆ CENTIFOLIÆ. *Ed.*

Syrup of Damaſk Roſes.

Take of
The freſh petals of the damaſk roſe, one pound;
Boiling water, four pounds;
Double refined ſugar, three pounds.

Macerate the roſes in the water for a night; then to the liquor ſtrained, and freed from the dregs, add the ſugar: boil them into a ſyrup.

SYRUPUS ROSÆ. *Lond.*

Syrup of Roſes.

Take of
The dried petals of the damaſk roſe, ſeven ounces;
Double refined ſugar, ſix pounds;
Boiling diſtilled water, four pints.

Macerate the roſes in the water for twelve hours, and ſtrain. Evaporate the ſtrained liquor to two pints and a half, and add the ſugar, that it may be made a ſyrup.

THIS ſyrup is an agreeable and mild purgative for children, in the doſe of half a ſpoonful, or a ſpoonful. It likewiſe proves gently laxative to adults; and with this intention may be of ſervice in coſtive habits.

Off. prep.—Elect. caſſiæ, *Ed. Lond. Dub.* Elect. ſcammon. *Lond.*

SYRUPUS SCILLÆ MARITIMÆ. *Ed.*

Syrup of Squills.

Take of
Vinegar of ſquills, two pounds;
Double refined ſugar in powder, three pounds and a half.

Diſſolve the ſugar with a gentle heat, ſo as to form a ſyrup.

THIS ſyrup was formerly prepared with ſome ſpices, intended to diminiſh the offenſiveneſs of the ſquills; but while they had not this effect, they often counteracted the intention in view, and are therefore omitted. It is uſed chiefly in doſes of a ſpoonful or two, for promoting expectoration, which it does very powerfully.

SYRUPUS TOLUIFERÆ BALSAMI; vulgo, SYRUPUS BALSAMICUS. *Ed.*

Syrup of Balſam of Tolu, formerly *Balſamic Syrup.*

Take of
Common ſyrup, two pounds;
Tincture of balſam of Tolu, one ounce.

With the ſyrup recently prepared, and when it has almoſt grown cold, after it has been removed from the fire, gradually mix the tincture with conſtant agitation.

SYRUPUS TOLUTANUS. *Lond.*
Syrup of Tolu.

Take of
The balſam of Tolu, eight ounces;
Diſtilled water, three pints.
Boil for two hours. Mix the double refined ſugar with the liquor, ſtrained after it is cold, that it may be made a ſyrup.

THE intention of the contrivers of the two foregoing proceſſes ſeems to have been ſomewhat different. In the latter, which is certainly the moſt elegant, the benzoic acid of the balſam alone is contained: the other ſyrup contains the whole ſubſtance of the balſam in larger quantity. They are both moderately impregnated with the agreeable flavour of the balſam.

SYRUPUS VIOLÆ ODORATÆ. *Edin.*
Syrup of Violets.

Take of
Freſh violets, one pound;
Boiling water, four pounds;
Double refined ſugar, ſeven pounds and a half.
Macerate the violets in the water for twenty-four hours in a glaſs or a glazed earthen veſſel, cloſe covered; then ſtrain without expreſſion, and to the ſtrained liquor add the ſugar, powdered, and make into a ſyrup.

SYRUPUS VIOLÆ. *Lond. Dub.*
Syrup of Violets.

Take of
The freſh petals of the violet, two pounds;
Boiling diſtilled water, five pints, (ſix pounds, *Dub.*)
Macerate for twenty-four hours; afterwards ſtrain the liquor, without expreſſion, through thin linen. Add double refined ſugar, that it may be made a ſyrup.

THIS ſyrup has a very agreeable flavour; and in the quantity of a ſpoonful or two proves to children gently laxative. It is apt to loſe, in keeping, the elegant blue colour, for which it is chiefly valued; and hence ſome have been induced to counterfeit it with materials whoſe colour is more permanent, and which are more eaſily obtained. This abuſe may be readily diſcovered, by adding to a little of the ſuſpected ſyrup any acid or alkaline liquor. If the ſyrup be genuine, the acid will change it red, and the alkali green; but if counterfeit, theſe changes will not happen. From this mutability of the colour of the violet, it forms an excellent teſt of the preſence of acids and alkalies; and, it is alſo obvious, that a preſcriber would be deceived if he ſhould expect to give any blue tinge to acidulated or alkalized juleps or mixtures, by the addition of the blue ſyrup.

CHAP. XXVII.

MEDICATED HONEYS.

MEL DESPUMATUM. *Ed. Dub.* MELLIS DESPUMATIO. *Lond. Clarified Honey. The Clarification of Honey.*

Melt the honey in a water bath, and remove the ſcum as it riſes.

IN this ſimple proceſs, the honey is rendered ſo liquid by the heat of the boiling water, that the wax and other lighter impurities which it commonly contains, riſe to the ſurface in the form of a ſcum, which is eaſily removed. At the ſame time, ſand or any heavier mixture of that kind ſinks to the bottom.

Honey was ſuppoſed to be peculiarly balſamic, and was therefore at one time much uſed in pharmacy. But as its ſaccharine matter is abſolutely of the ſame nature with that of ſugar, and as the extraneous matters which it always contains, make it diſagree with the ſtomachs of many individuals, the number of medicated honeys has been much diminiſhed, and their place in ſome inſtances ſupplied by ſyrups. Medicated honeys are known to be of a proper conſiſtence, by allowing a ſmall quantity to cool on a plate; if when divided by the edge of a ſpoon, the portions do not immediately unite, or if the ſpecific gravity, when hot, be 1.26, or 1.31, when cold.

MEL ACETATUM. *Lond.* OXYMEL SIMPLEX. *Dub.*
Acetated Honey. Simple Oxymel.

Take of
Clarified honey, two pounds;
Diſtilled vinegar, one pound by weight.

Boil them in a glaſs veſſel with a gentle fire to the conſiſtency of a ſyrup, (*Lond.*)

Having mixed them, bring them thrice to boil in a glaſs veſſel, and remove the ſcum each time, (*Dub.*)

This was once in great repute as a cooling and attenuating medicine; it is ſcarcely uſed in modern practice, except in colds attended with coughs, and in ſore throats, for which, when diluted with ſome aromatic or aſtringent infuſion, as ſage tea, roſe flower tea, &c. it makes uſeful gargles.

OXYMEL COLCHICI. *Lond.*

Oxymel of Meadow Saffron.

Take of

The freſh root of meadow ſaffron, cut into thin ſlices, one ounce;
Diſtilled vinegar, one pint;
Clarified honey, two pounds.

Macerate the root of meadow ſaffron, with the vinegar, in a glaſs veſſel, with a gentle heat, for forty-eight hours. Strain the liquor, preſſed out ſtrongly from the root, and add the honey. Laſtly, boil the mixture, frequently ſtirring it with a wooden ſpoon, to the thickneſs of a ſyrup.

This is an active preparation, but its uſe may be entirely ſuperſeded by the ſyrup of the ſame root.

MEL ROSÆ. *Lond. Dub.*

Honey of Roſes.

Take of

Dried red-roſe buds, (with the heels cut off, *Dub.*) four ounces;
Boiling diſtilled water, three pints;
Clarified honey, (Honey, *Dub.*) five pounds.

Macerate the roſe leaves in the water for ſix hours; then mix the honey with the ſtrained liquor, and boil the mixture to the thickneſs of a ſyrup, (removing the ſcum, *Dub.*)

This preparation is not unfrequently uſed as a mild cooling detergent, particularly in gargariſms for ulcerations and inflammation of the mouth and tonſils. The roſe buds here uſed ſhould be haſtily dried, that they may the better preſerve their aſtringency.

The Dublin college, in making this and other ſimilar preparations, uſe unclarified honey, with the idea, probably, that it may be equally well clarified in the courſe of the preparation itſelf. This is no doubt true, but as we do not know what effect the clarification may have on the active ſubſtances added to the honey, we think that the uſe of clarified honey, as directed by the London college, is preferable.

MEL SCILLÆ. *Lond.* MEL SCILLITICUM. *Dub.*
Honey of Squills.

Take of
Clarified honey, (Honey, *Dub.*) three pounds ;
Tincture of ſquills, two pints.
Boil them in a glaſs veſſel to the thickneſs of a ſyrup, (removing the ſcum, *Dub.*)

THE honey will here be impregnated with all the active parts of the ſquills which the tincture before contained, and may be employed as an uſeful expectorant or diuretic.

OXYMEL SCILLÆ. *Lond.*
Oxymel of Squills.

Take of
Clarified honey, three pounds ;
Vinegar of ſquills, two pints.
Boil them in a glaſs veſſel, with a ſlow fire, to the thickneſs of a ſyrup.

OXYMEL of ſquills is a uſeful aperient, detergent, and expectorant, and of great ſervice in humoral aſthmas, coughs, and other diſorders where thick phlegm abounds. It is given in doſes of two or three drachms, along with ſome aromatic water, as that of cinnamon, to prevent the great nauſea which it would otherwiſe be apt to excite. In large doſes, it proves emetic.

OXYMEL ÆRUGINIS. *Lond.*
Oxymel of Verdegris.

Take of
Prepared verdegris, one ounce ;
Vinegar, ſeven ounces ;
Clarified honey, fourteen ounces.
Diſſolve the verdegris in the vinegar, and ſtrain it through linen ; then add the honey, and boil the whole to a proper thickneſs.

IT is uſed only externally for cleanſing foul ulcers, and keeping down fungous fleſh. It is alſo often ſerviceable in venereal ulcerations of the mouth and tonſils : but there is ſome danger from its application to places from the ſituation of which it is apt to be ſwallowed ; for even a ſmall quantity of verdegris paſſing into the ſtomach may be productive of diſtreſſing, if not deleterious, effects.

CHAP. XXVIII.

EMULSIONS and MIXTURES.

In this chapter we comprehend thoſe mixtures in which oils and other ſubſtances inſoluble in water are mixed with, and ſuſpended in, watery fluids, by means of viſcid ſubſtances, ſuch as mucilage and ſyrups.

EMULSIO AMYGDALÆ COMMUNIS. *Edin.*

Almond Emulſion.

Take of
  Sweet almonds, one ounce;
  Water, two pounds and a half.

Beat the blanched almonds in a ſtone mortar, gradually pouring on them the water; then ſtrain off the liquor.

LAC AMYGDALÆ. *Lond.* LAC AMYGDALARUM. *Dub.*

Almond Milk.

Take of
  Sweet almonds, an ounce and a half;
  Double refined ſugar, half an ounce;
  Diſtilled water, two pints.

Beat the almonds with the ſugar; then, rubbing them together, add by degrees the water, and ſtrain the liquor.

EMULSIO ARABICA. *Edin.*

Arabic Emulſion.

This is made in the ſame manner as the almond emulſion; only adding, while beating the almonds,
Mucilage of gum arabic, two ounces.

EMULSIO ARABICA. *Dub.*

Arabic Emulſion.

Take of
  Gum arabic, in powder, two drachms;
  Almonds, blanched, half an ounce;
  Double refined ſugar, three drachms;
  Decoction of barley, one pound.

Diſſolve the gum in the warm decoction, and when it is almoſt cold, pour it upon the almonds, previouſly well beaten with the ſugar, and at the ſame time triturate them together, ſo as to form a kind of milk, and then filter.

All theſe may be conſidered as poſſeſſing nearly the ſame qualities. They are merely mechanical ſuſpenſions of oil of almonds in watery fluids, by means either of the mucilage with which it is naturally combined in the almonds by itſelf, or aſſiſted by the addition of gum arabic and ſugar. Therefore, on ſtanding for ſome days, the oily matter ſeparates and riſes to the top, not in a pure form, but like thick cream. By heat the ſame decompoſition is immediately effected.

Great care ſhould be taken that the almonds have not become rancid by keeping, which not only renders the emulſion extremely unpleaſant, a circumſtance of great conſequence in a medicine that requires to be taken in large quantities, but likewiſe gives it injurious qualities.

The almonds are blanched by infuſing them in boiling water, and peeling them. The ſucceſs of the preparation depends upon beating the almonds to a ſmooth pulp, and triturating them with each portion of the watery fluid, ſo as to form an uniform mixture before another portion be added.

Theſe liquors are principally uſed for diluting and correcting acrimonious humours; particularly in heat of urine and ſtranguries, ariſing either from a natural acrimony of the juices, or from the operation of cantharides, and other irritating medicines: in theſe caſes, they are to be drunk frequently, to the quantity of half a pint or more at a time.

EMULSIO CAMPHORATA. *Ed.*

Camphorated Emulſion.

Take of

Camphor, one ſcruple;
Sweet almonds, blanched, two drachms;
Double refined ſugar, one drachm;
Water, ſix ounces.

This is to be made in the ſame manner as the common emulſion.

Mistura Camphorata. *Lond.*

Camphorated Mixture.

Take of

Camphor, one drachm;
Rectified ſpirit of wine, a little;
Double refined ſugar, half an ounce;

Boiling diſtilled water, one pint.

Rub the camphor firſt with the ſpirit of wine, then with the ſugar; laſtly, add the water by degrees, and ſtrain the mixture.

Neither of theſe mixtures are very permanent, as the camphor ſeparates and ſwims upon the ſurface in the courſe of a few days. As extemporaneous preſcriptions, they are, however, very convenient modes of exhibiting that active drug, and may be given to the extent of a table ſpoonful every three or four hours in typhoid fevers. In the preceding edition of the London Pharmacopœia, ten drops of ſpirit were ordered inſtead of the preſent indeterminate quantity.

LAC AMMONIACI. *Lond. Dub.*

Emulſion of Gum Ammoniac.

Take of

Gum ammoniac, two drachms;

Diſtilled water, half a pint, (eight ounces, *Dub.*)

Rub the gum reſin with the water, gradually poured on, until it becomes an emulſion.

Lac Assæ Foetidæ. *Lond.*

Emulſion of Aſſa Fœtida.

In the ſame manner may be made an emulſion of aſſa fœtida, and of the reſt of the gum reſins.

The lac ammoniaci is employed for attenuating tough phlegm, and promoting expectoration, in humoral aſthmas, coughs, and obſtructions of the viſcera. It may be given to the quantity of two ſpoonfuls twice a-day.

The lac aſſæ fœtidæ is employed in ſpaſmodical, hyſterical, and other nervous, affections. And it is alſo not unfrequently uſed under the form of injection. It anſwers the ſame purpoſes as aſſa fœtida in ſubſtance.

MISTURA MOSCHATA. *Lond.*

Muſk Mixture.

Take of

Muſk, two ſcruples;

Gum arabic, powdered,

Double refined ſugar, of each one drachm;

Roſe water, ſix ounces, by meaſure.

Rub the muſk firſt with the ſugar, then with the gum, and add the roſe water by degrees.

Unless the muſk be very thoroughly triturated with the ſugar and gum before the addition of the water it ſoon ſeparates. An ounce, or an ounce and a half, may be taken for a doſe.

POTIO CARBONATIS CALCIS; olim, POTIO CRETACEA. *Edin.*

Chalk Potion.

Take of
Prepared carbonate of lime, one ounce;
Double refined ſugar, half an ounce;
Mucilage of gum arabic, two ounces.
Triturate together, and then gradually add of
Water, two pounds and a half;
Spirit of cinnamon, two ounces.
Mix them.

MISTURA CRETACEA. *Lond. Dub.*

Chalk Mixture.

Take of
Prepared chalk, one ounce, (half an ounce, *Dub.*);
Double refined ſugar, ſix drachms, (three drachms, *Dub.*);
Gum arabic, powdered, one ounce;
Diſtilled water, two pints, (fifteen ounces, *Dub.*)
Mix them.

THIS is a very elegant form of exhibiting chalk, and is an uſeful remedy in diſeaſes ariſing from, or accompanied with, acidity in the primæ viæ. It is frequently employed in diarrhœa proceeding from that cauſe. The mucilage not only ſerves to keep the chalk uniformly diffuſed, but alſo improves its virtues. The doſe of this medicine requires no nicety. It may be taken to the extent of a pound or two in the courſe of a day.

Theſe two preparations agree pretty much, both in their name and in their nature; but that of the Edinburgh college is moſt agreeable to the palate, from containing a proportion of cinnamon water, by which the diſagreeable taſte of the chalk is taken off.

DECOCTUM CORNU CERVI. *Lond.*

Decoction of Hartſhorn.

Take of
Burnt and prepared hartſhorn, two ounces;
Gum arabic, ſix drachms;
Diſtilled water, three pints.
Boil, conſtantly ſtirring, to two pints; and ſtrain.

PREPARED hartſhorn is phoſphate of lime in a minute ſtate of mechanical diviſion. By boiling in a mucilaginous liquid, it will be diffuſed and imperfectly ſuſpended, but not a particle of it will be diſſolved. This is therefore an extremely injudicious preparation; for phoſphate of lime would be much more eaſily and effectually ſuſpended by triturating it with a larger proportion of gum arabic, and adding the water gradually. But we believe that this preparation has no other action than that of a weak mucilage.

CHAP. XXIX.

MEDICATED VINEGARS.

Infusions of vegetable ſubſtances in acetic acid are commonly called Medicated Vinegars. The action of the acid in this caſe may be conſidered as twofold.

1. It acts ſimply as water, in conſequence of the great quantity of water which enters into its compoſition, and generally extracts every thing which water is capable of extracting.

2. It exerts its own peculiar action as an acid. In conſequence of this, it ſometimes increaſes the ſolvent power of its watery portion, or diſſolves ſubſtances which water alone is incapable of diſſolving, and in a few inſtances it impedes the ſolution of ſubſtances which water alone would diſſolve.

As acetic acid, in itſelf ſufficiently periſhable, has its tendency to decompoſition commonly increaſed by the ſolution of any vegetable matter in it, it ſhould never be uſed as a menſtruum, unleſs where it promotes the ſolution of the ſolvend, as in extracting the acrid principle of ſquills, colchicum, &c. and in diſſolving the volatile, and eſpecially the empyreumatic, oils, or where it coincides with the virtues of the ſolvend.

ACETUM AROMATICUM. *Ed.*
Aromatic Vinegar.

Take of
Tops of roſemary, dried,
Leaves of ſage, dried, each four ounces;

Flowers of lavender, dried, two ounces;
Cloves, two drachms;
Diſtilled acetous acid, eight pounds.
Macerate for ſeven days, expreſs the liquor, and ſtrain it.

This is given as an improved preparation of the *Vinaigre des quatre voleurs*, which was ſuppoſed to be a certain prophylactic againſt the contagion of plague, and ſimilar diſeaſes. It is in fact a pleaſant ſolution of eſſential oils in vinegar, which will have more effect in correcting bad ſmells than in preventing fever.

ACETUM COLCHICI. *Dub.*
Vinegar of Meadow Saffron.

Take of
The recent root of colchicum, cut in ſlices, one ounce;
Vinegar, one pound;
Diluted ſpirit of wine, one ounce and a half.
Macerate the root in the vinegar for four days, in a glaſs veſſel, frequently agitating them; then expreſs the acid, to which decanted from the feces, after they have ſubſided, add the ſpirit.

The acrid principle in which the virtue of the colchicum reſides, is more ſoluble in vinegar than in water: this is therefore a preparation of conſiderable activity. The diluted alcohol is added merely to prevent it from ſpoiling.

ACETUM SCILLÆ MARITIMÆ. *Ed.*
Vinegar of Squills.

Take of
Dried root of ſquills, two ounces;
Diſtilled acetous acid, two pounds and a half;
Alcohol, three ounces.
Macerate the ſquills with the acetous acid for ſeven days; then preſs out the acid, to which add the alcohol; and when the feces have ſubſided, pour off the clear liquor.

Acetum Scillæ. *Lond.*
Vinegar of Squills.

Take of
Squills, recently dried, one pound;
Vinegar, ſix pints;
Proof ſpirit, half a pint.
Macerate the ſquills with the vinegar in a glaſs veſſel, with a gentle heat for twenty-four hours; then expreſs the liquor, and ſet it

aſide until the feces ſubſide. To the decanted liquor add the ſpirit.

ACETUM SCILLITICUM. *Dub.*
Squill Vinegar.

Take of
Squills, recently dried, half a pound;
Vinegar, three pounds;
Proof ſpirit, four ounces.

Macerate the ſquills in the vinegar for four days in a glaſs veſſel, frequently agitating it; then expreſs the acid; to which, poured from the feces after they have ſubſided, add the ſpirit.

VINEGAR of ſquills is a medicine of great antiquity. It is a very powerful ſtimulant; and hence it is frequently uſed, with great ſucceſs, as a diuretic and expectorant. The doſe of this medicine is from a drachm to half an ounce: where crudities abound in the firſt paſſages, it may be given at firſt in a larger doſe, to evacuate them by vomiting. It is moſt conveniently exhibited along with cinnamon, or other agreeable aromatic waters, which prevent the nauſea it would otherwiſe, even in ſmall doſes, be apt to occaſion.

Off. prep.—Syr. ſcillæ, *Ed*

ACIDUM ACETOSUM CAMPHORATUM. *Ed.*
Camphorated Acetous Acid.

Take of
The ſtronger acetous acid, ſix ounces;
Camphor, half an ounce;
Alcohol, a ſufficient quantity.

Reduce the camphor to powder, by triturating it with the alcohol; then add it to the acid, and diſſolve.

THE alcohol in this preparation is uſed merely to facilitate the reduction of the camphor to powder; for the ſtrong acetous, or, as we would rather call it, the acetic acid, is capable of diſſolving even a larger proportion of camphor than is directed in the above formula.

This ſolution is a powerful analeptic remedy. Its vapour ſnuffed up the noſtrils, which is the only method of uſing it, is one of the moſt pungent ſtimuli we poſſeſs. It is ſo extremely volatile, that it cannot be preſerved without excluding it from the contact of the air; and it is ſo powerful a menſtruum, that it corrodes cork, and almoſt all common metals except gold. It ſhould therefore be kept in glaſs phials, with ground glaſs ſtoppers, or in ſmall gold boxes, ſuch as are uſed for Henry's aromatic ſpirit of vinegar, for which it is in fact a ſimpler ſubſtitute.

CHAP. XXX.

TINCTURES.

The term Tincture has often been employed in a very vague ſenſe. It is now commonly applied to ſolutions, made by digeſtion, in alcohol, or diluted alcohol. But it is alſo, though perhaps incorrectly, extended to ſolutions in ether, ethereal ſpirits, and ſpirit of ammonia.

Alcohol is capable of diſſolving reſins, gum reſins, extractive, tannin, ſugar, volatile oils, ſoaps, camphor, adipocere, colouring matters, acids, alkalies, and ſome compound ſalts. Many of theſe, as the gum reſins, ſoaps, extractive, tannin, ſugar, and ſaline ſubſtances, are alſo ſoluble in water, while water is capable of diſſolving ſubſtances, ſuch as gum, gelatin, and moſt of the compound ſalts, which are inſoluble in alcohol. But the inſolubility of theſe ſubſtances in the different menſtrua is not abſolute, but merely relative; for a certain proportion of alcohol may be added to a ſolution of gum in water without decompoſing it; and a ſolution of reſin in alcohol will bear a certain admixture of water without becoming turbid. Therefore, diluted alcohol, which is a mixture of theſe two menſtrua, ſometimes extracts the virtues of heterogeneous compounds more completely than either of them ſeparately.

Alcohol is uſed as a menſtruum,

1. When the ſolvend is not ſoluble, or ſparingly ſoluble, in water.
2. When a watery ſolution of the ſolvend is extremely periſhable.
3. When the uſe of alcohol is indicated as well as that of the ſolvend.

In making alcoholic tinctures, we muſt obſerve, that the virtues of recent vegetable matters are very imperfectly extracted by ſpiritous menſtrua. They muſt therefore be previouſly carefully dried, and as we cannot aſſiſt the ſolution by means of heat, we muſt facilitate it by reducing the ſolvend to a ſtate of as minute mechanical diviſion as poſſible. To prevent loſs, the ſolution is commonly made in a cloſe veſſel, and the heat applied muſt be very gentle, leſt it be broken by the expanſion of vapour.

The action of tinctures on the living ſyſtem is always compounded of the action of the menſtruum, and of the matters diſſolved in it. Now, theſe actions may either coincide with, or oppoſe, each other; and as alcohol is at all times a powerful agent, it is evident that no ſubſtance ſhould be exhibited in the form of a tincture, whoſe action is different from that of alcohol, unleſs it be capable of operating in ſo ſmall a doſe, that the quantity of alcohol taken along with it is inconſiderable.

Tinctures are not liable to ſpoil, as it is called, but they muſt nevertheleſs be kept in well cloſed phials, eſpecially when they contain active ingredients, to prevent the evaporation of the menſtruum.

They generally operate in doſes ſo ſmall, that they are rarely exhibited by themſelves, but commonly combined with ſome vehicle. In chooſing the latter, we muſt ſelect ſome ſubſtance which does not decompoſe the tincture, or at leaſt ſeparates nothing from it in a palpable form.

The London college direct all tinctures, except that of muriate of iron, to be prepared in cloſed phials.

The Dublin college explain, that, when they order ſubſtances to be *digeſted*, they mean it to be done with a low degree of heat; and when they are to be *macerated*, it is to be done with a degree of heat between 60° and 90°.

TINCTURA ALOES SOCOTORINÆ. *Ed.* TINCTURA ALOES. *Dub.*

Tincture of Socotorine Aloes.

Take of
Socotorine aloes, in powder, half an ounce;
Extract of liquorice, an ounce and a half;
Alcohol, four ounces;
Water, one pound.

Digeſt for ſeven days in a cloſed veſſel, with a gentle heat, and frequent agitation. (Theſe directions are to be obſerved in preparing all tinctures, *Ed.*)

TINCTURA ALOES. *Lond.*
Tincture of Aloes.

Take of
Socotorine aloes, powdered, half an ounce;
Extract of liquorice, an ounce and a half;
Diſtilled water,
Proof ſpirit, of each eight ounces by meaſure.
Digeſt in a ſand bath, now and then ſhaking the veſſel, until the extract be diſſolved, and then ſtrain.

THE Dublin college uſe the ſame proportion with the Edinburgh college, but in double quantity; and they direct the extract of liquorice to be ſoftened in the water made boiling hot, which facilitates its ſolution. The London college order the fluids by meaſure; and ſixteen by meaſure are only equal to fourteen ounces and a half by weight.

In this ſimple tincture, all the active parts of the aloes are ſuſpended in the menſtruum. The extract of liquorice ſerves both to aſſiſt the ſuſpenſion, and to cover the taſte, of the aloes; and in thoſe caſes where we wiſh for the operation of the aloes alone, this is perhaps one of the beſt formulæ for its exhibition in a fluid ſtate. About an ounce may be taken for a doſe.

TINCTURA ALOES CUM MYRRHA. *Ed.*
Tincture of Aloes with Myrrh.

Take of
Myrrh, in powder, two ounces;
Alcohol, one pound and a half;
Water, half a pound.
Mix the alcohol with the water, then add the myrrh; digeſt for four days; and, laſtly, add
Socotorine aloes, one ounce and a half;
Saffron, an ounce.
Digeſt again for three days, and pour off the tincture from the ſediment.

TINCTURA ALOES COMPOSITA. *Lond.*
Compound Tincture of Aloes.

Take of
Socotorine aloes,
Saffron, of each three ounces;
Tincture of myrrh, two pints.
Digeſt for eight days, and ſtrain.

THIS is ſuppoſed to be an improvement on the elixir proprietatis of Paracelſus. Theſe tinctures differ conſiderably in ſtrength; the latter contains one part of aloes to eight of the menſtruum; the former one to ſixteen, while the ſimple tincture already mentioned contains but one to thirty-two. In preſcription theſe proportions muſt be attended to. The myrrh and ſaffron may add to its ſtimulating properties.

TINCTURA AMOMI REPENTIS. *Ed.*

Tincture of Cardamom.

Take of
Leſſer cardamom ſeeds, four ounces;
Diluted alcohol, two pounds and a half.
Macerate for ſeven days, and ſtrain through paper.

TINCTURA CARDAMOMI. *Lond. Dub.*

Tincture of Cardamom.

Take of
Leſſer cardamom ſeeds, huſked and bruiſed, three ounces;
Proof ſpirit, two pints, (two pounds, *Dub.*)
Digeſt for eight days, (ſeven, *Dub.*) and ſtrain.

Tincture of cardamoms has been in uſe for a conſiderable time. It is a pleaſant warm cordial; and may be taken, along with any proper vehicle, in doſes of from a drachm to a ſpoonful or two.

TINCTURA CARDAMOMI COMPOSITA. *Lond. Dub.*

Compound Tincture of Cardamom.

Take of
Leſſer cardamom ſeeds, huſked,
(Cochineal, *Lond.*)
Caraway ſeeds, each, powdered, two drachms;
Cinnamon, bruiſed, half an ounce;
Raiſins, ſtoned, four ounces;
Proof ſpirit, two pints, (two pounds, *Dub.*)
Digeſt for fourteen days, and ſtrain.

This tincture contains ſo ſmall a proportion of cardamoms as to be hardly intitled to derive its name from that article. Altogether, although it may be ſufficiently pleaſant, the compoſition is injudicious; for the large proportion of raiſins uſed forms only a very uneconomical and inelegant method of ſweetening an aromatic tincture.

TINCTURA ARISTOLOCHIÆ SERPENTARIÆ. *Ed.*

Tincture of Snake-root.

Take of
Virginian ſnake-root, two ounces;
Cochineal, one drachm;
Diluted alcohol, two pounds and a half.
Digeſt for ſeven days, and ſtrain through paper.

TINCTURA SERPENTARIÆ. *Lond. Dub.*

Tincture of Snake-root.

Take of
Virginian ſnake-root, three ounces;
Proof ſpirit, two pints, (two pounds, *Dub.*)
Digeſt for eight days, (ſeven, *Dub.*) and ſtrain.

THIS tincture, which contains the whole virtues of the root, may be taken to the quantity of a ſpoonful or more every five or ſix hours; and to this extent it often operates as an uſeful diaphoretic.

TINCTURA ASSÆ FOETIDÆ. *Ed. Dub. Lond.*

Tincture of Aſſa fœtida.

Take of
Aſſa fœtida, four ounces;
Alcohol, two pounds and a half, *Ed.* (Two pints, *Lond.*)
Digeſt for ſeven days, (ſix days, *Lond.*) and ſtrain through paper.

Dub.

Take of
Aſſa fœtida, four ounces;
Rectified ſpirit of wine, two pounds;
Water, eight ounces.
Add the ſpirit to the aſſa fœtida, triturated with the water, and digeſt for ſeven days; then ſtrain.

THIS tincture poſſeſſes the virtues of the aſſa fœtida itſelf; and may be given in doſes of from ten drops to fifty or ſixty.

TINCTURA AURANTII CORTICIS. *Lond. Dub.*

Tincture of Orange-Peel.

Take of
Freſh orange-peel, three ounces;
Proof ſpirit, two pints, (two pounds, *Dub.*)
Digeſt for three days; and ſtrain.

THIS tincture is an agreeable bitter, flavoured at the ſame time with the eſſential oil of the orange-peel.

TINCTURA BALSAMI PERUVIANI. *Lond.*

Tincture of Balſam of Peru.

Take of
  Balſam of Peru, four ounces;
  Rectified ſpirit of wine, one pint.
Digeſt until the balſam be diſſolved.

THE whole of the Peruvian balſam is diſſolved by ſpirit of wine: this therefore may be conſidered as a good method of freeing it from its impurities; while at the ſame time it is thus reduced to a ſtate under which it may be readily exhibited: but at preſent it is very little employed, unleſs in compoſition, either under this or any other form.

TINCTURA BENZOES COMPOSITA; vulgo, BALSAMUM TRAUMATICUM. *Lond. Ed.*

Compound Tincture of Benzoin.

Take of
  Benzoin, three ounces;
  (Storax, ſtrained, two ounces, *Lond.*)
  Balſam of Tolu, one ounce;
  Socotorine aloes, half an ounce;
  Rectified ſpirit of wine, two pints.
Digeſt with a gentle heat for three days, (ſeven, *Ed.*) and ſtrain.

THE Edinburgh college omit the ſtorax, and uſe hepatic aloes in place of the ſocotorine. Theſe differences are not very material; and both preparations may be conſidered as elegant ſimplifications of ſome very complicated compoſitions, which were celebrated under different names; ſuch as Baume de Commandeur, Wade's balſam, Friars balſam, Jeſuits drops, &c. Theſe, in general, conſiſted of a confuſed farrago of diſcordant ſubſtances. They, however, derived conſiderable activity from the benzoin and aloes; and every thing to be expected from them may readily be obtained from the preſent formulæ.

TINCTURA CAMPHORÆ; vulgo, SPIRITUS VINOSUS CAMPHORATUS. *Edin.* SPIRITUS CAMPHORATUS. *Lond. Dub.*

Tincture of Camphor. Camphorated Spirit.

Take of
  Camphor, one ounce, *Ed.* four ounces, *Lond.* half an ounce, *Dub.*

Alcohol, one pound, *Ed.* two pints, *Lond.* eight ounces, *Dub.*
Mix them together, that the camphor may be diſſolved.
(It may alſo be made with a double, triple, &c. proportion of camphor, *Ed.*)

These ſolutions of camphor are only employed for external uſes, againſt rheumatic pains, paralytic numbneſſes, inflammations, for diſcuſſing tumours, preventing gangrenes, or reſtraining their progreſs. They are too pungent to be exhibited internally, and cannot be diluted with water, without being totally decompoſed.

Off. prep.—Aqua zinci vit. cum camph. *Lond.*

TINCTURA CASCARILLÆ. *Lond. Dub.*

Tincture of Caſcarilla.

Take of
The bark of caſcarilla, powdered, four ounces;
Proof ſpirit, two pints, (two pounds, *Dub.*)
Digeſt with a gentle heat for eight days, (ſeven, *Dub.*) and ſtrain.

Proof spirit readily extracts the active powers of the caſcarilla; and the tincture may be employed to anſwer moſt of thoſe purpoſes for which the bark itſelf is recommended: but in the cure of intermittents, it in general requires to be exhibited in ſubſtance.

TINCTURA CASSIÆ SENNÆ COMPOSITA; vulgo, ELIXIR SALUTIS. *Edin.*

Compound Tincture of Senna, commonly called *Elixir of Health.*

Take of
Senna leaves, two ounces;
Jalap root, one ounce;
Coriander ſeeds, half an ounce;
Diluted alcohol, three pounds and a half.
Digeſt for ſeven days, and to the ſtrained liquor add four ounces of double refined ſugar.

Tinctura Sennæ. *Lond. Dub.*

Tincture of Senna.

Take of
Senna, one pound;
Caraway ſeeds, bruiſed, one ounce and a half;
Leſſer cardamom ſeeds, bruiſed, (and huſked, *Dub.*) half an ounce;

Raiſins, ſtoned, ſixteen ounces;
Proof ſpirit, one gallon, (nine pounds, *Dub.*)
Digeſt for fourteen days, and ſtrain.

Both theſe tinctures are uſeful carminatives and cathartics, eſpecially to thoſe who have accuſtomed themſelves to the uſe of ſpiritous liquors; they often relieve flatulent complaints and colics, where the common cordials have little effect: the doſe is from one to two ounces.

TINCTURA CASTOREI. *Lond. Dub.*

Tincture of Caſtor.

Take of
Ruſſian caſtor, powdered, two ounces;
Proof ſpirit, two pints, (two pounds, *Dub.*)
Digeſt for ten days, (ſeven, *Dub.*) and ſtrain.

Edin.

Take of
Ruſſian caſtor, an ounce and a half;
Alcohol, one pound.
Digeſt them for ſeven days, and ſtrain through paper.

It has been diſputed whether a weak or rectified ſpirit, and whether cold or warm digeſtion, are preferable for making this tincture.

From ſeveral experiments made to determine this queſtion, it appears that caſtor, macerated without heat, gives out its finer and moſt grateful parts to either ſpirit, but moſt perfectly to the rectified: that heat enables both menſtrua to extract the greateſt part of its groſſer and more nauſeous matter: and that proof ſpirit extracts this laſt more readily than rectified.

The tincture of caſtor is recommended in moſt kinds of nervous complaints and hyſteric diſorders: in the latter, it ſometimes does ſervice, though many have complained of its proving ineffectual. The doſe is from twenty drops to forty, fifty, or more.

Off. prep.—Tinct. ſabinæ comp. *Lond.*

TINCTURA CINCHONÆ OFFICINALIS. *Ed.* Tinctura Corticis Peruviani. *Dub. Lond.*

Tincture of Cinchona, or Peruvian Bark.

Take of
Cinchona bark, four ounces, (ſix ounces, *Lond.*)

Diluted alcohol, two pounds and a half, (two pounds, *Dub.* two pints, *Lond.*)
Digeſt for ſeven days, (eight days, *Lond.*) and ſtrain, (through paper, *Ed.*)

This tincture is certainly impregnated with the virtues of cinchona, but not to ſuch a degree that it can be given in ſufficient doſes to act as cinchona, without exhibiting more alcohol than what is proper to be given as a medicine. Indeed, we are afraid that this and other bitter and tonic tinctures, as they are called, are with ſome only an apology for dram drinking, and that the moſt apparent effects they produce are thoſe of a ſlight degree of intoxication.

TINCTURA CINCHONÆ, sive CORTICIS PERUVIANI, COMPOSITA. *Lond. Dub.*

Compound Tincture of Peruvian Bark.

Take of
Peruvian bark, powdered, two ounces;
Exterior peel of Seville oranges, dried, one ounce and a half, (half an ounce, *Dub.*)
Virginian ſnake root, bruiſed, three drachms;
Saffron, one drachm;
(Cochineal, powdered, two ſcruples, *Lond.*)
Proof ſpirit, twenty ounces, (two pounds, *Dub.*)
Digeſt for fourteen days, and ſtrain.

This has been for a conſiderable time celebrated under the title of *Huxham's Tincture of Bark.*

As a corroborant and ſtomachic, it is given in doſes of two or three drachms: but when employed for the cure of intermittents, it muſt be taken to a greater extent.

TINCTURA COLOMBÆ. *Lond. Ed. Dub.*

Tincture of Colomba.

Take of
Colomba root, powdered, two ounces and a half, (two ounces, *Ed. Dub.*)
Proof ſpirit of wine, two pints.
Digeſt for eight days, (ſeven, *Ed. Dub.*) and ſtrain.

The colomba readily yields its active qualities to the menſtruum here employed; and accordingly, under this form, it may be advantageouſly employed againſt bilious vomitings, and thoſe different ſtomach complaints, in which the colomba has been found uſeful; but where there does not occur ſome objection to its uſe in ſubſtance, that form is in general preferable to the tincture.

TINCTURA CONVOLVULI JALAPÆ. *Ed.* TINCTURA JALAPÆ. *Lond. Dub.*

Tincture of Jalap.

Take of
Jalap, in coarſe powder, three ounces, (eight ounces, *Lond. Dub.*)
Diluted alcohol, fifteen ounces, (two pints, *Lond.* two pounds, *Dub.*)
Digeſt them for ſeven days, (eight days, *Lond. Dub.*) and ſtrain the tincture through paper.

ALCOHOL was formerly ordered for the preparation of this tincture; but diluted alcohol is a preferable menſtruum, as it diſſolves the active conſtituents of the jalap as well as pure alcohol, and is leſs ſtimulating.

TINCTURA CROCI. *Ed.*

Tincture of Saffron.

Take of
Engliſh ſaffron, one ounce;
Diluted alcohol, fifteen ounces.
After digeſting them for ſeven days, let the tincture be ſtrained through paper.

THE proof ſpirit is a very proper menſtruum for extracting the medical virtues of the ſaffron, and affords a convenient mode of exhibiting that drug, the qualities of which were mentioned in the materia medica.

TINCTURA DIGITALIS PURPUREÆ. *Ed.*

Tincture of Foxglove,

Take of
The dried leaves of foxglove, one ounce;
Diluted alcohol, eight ounces.
Digeſt for ſeven days, and ſtrain through paper.

THIS tincture is a very powerful medicine, and contains the virtues of the foxglove in a very manageable form. It has been chiefly uſed to diminiſh the force of the circulation of the blood in hæmoptyſis, and often with remarkable ſucceſs. It has been alſo ſaid to cure phthiſis pulmonalis, but ſubſequent experience has not confirmed the firſt trials. Like every other form in which foxglove is given, it ſhould be given in very ſmall doſes at firſt, ſuch as from ten to twenty drops, and cautiouſly increaſed.

TINCTURA GALBANI. *Lond.*

Tincture of Galbanum.

Take of
- Galbanum, cut into ſmall pieces, two ounces;
- Proof ſpirit of wine, two pints.

Digeſt with a gentle heat for eight days, and ſtrain.

Galbanum is one of the ſtrongeſt of the fetid gums; and although leſs active, it is much leſs diſagreeable than aſſa fœtida; and under the form of tincture it may be ſucceſsfully employed in caſes of flatulence and hyſteria, where its effects are immediately required, particularly with thoſe who cannot bear aſſa fœtida.

TINCTURA GENTIANÆ COMPOSITA; vulgo, ELIXIR STOMACHICUM. *Ed.*

Compound Tincture of Gentian, commonly called *Stomachic Elixir.*

Take of
- Gentian root, two ounces;
- Seville orange-peel, dried, one ounce;
- Canella alba, half an ounce;
- Cochineal, half a drachm;
- Diluted alcohol, two pounds and a half.

Macerate for ſeven days, and ſtrain through paper.

Lond.

Take of
- Gentian root, ſliced and bruiſed, two ounces;
- Exterior dried peel of Seville oranges, one ounce;
- Leſſer cardamom ſeeds, huſked and bruiſed, half an ounce;
- Proof ſpirit of wine, two pints.

Digeſt for eight days, and ſtrain.

These are very elegant ſpiritous bitters. As the preparations are deſigned for keeping, lemon peel, an excellent ingredient in the watery bitter infuſions, has, on account of the periſhableneſs of its flavour, no place in theſe. The aromatics are here very commodious ingredients, as in this ſpiritous menſtruum they are free from the inconvenience with which they are attended in other liquors, of diminiſhing their tranſparency.

TINCTURA GUAIACI. *Ed.*

Tincture of Guaiac.

Take of
  Gum guaiac, one pound;
  Alcohol, two pounds and a half.
Digeſt for ten days, and ſtrain.

What is called gum guaiac is in fact a reſin, and perfectly ſoluble in alcohol. This ſolution is a powerful ſtimulating ſudorific, and may be given in doſes of about half an ounce in rheumatic and arthritic caſes. It was once ſuppoſed to be a ſpecific againſt the gout.

TINCTURA HELLEBORI NIGRI. *Lond. Dub.*

Tincture of Black Hellebore.

Take of
  Black hellebore, in coarſe powder, four ounces;
  (Cochineal, powdered, two ſcruples, *Lond.*)
  Proof ſpirit of wine, two pints, (two pounds, *Dub.*)
Digeſt with a gentle heat for eight days, (ſeven, *Dub.*) and ſtrain.

Edin.

Take of
  Black hellebore root, four ounces;
  Cochineal, half a drachm;
  Diluted alcohol, two pounds and a half.
Digeſt them together ſeven days, and afterwards filter the tincture through paper.

This is perhaps the beſt preparation of hellebore, when deſigned for an alterative, the menſtruum here employed extracting the whole of its virtues. It has been found, from experience, particularly ſerviceable in uterine obſtructions. In ſanguine conſtitutions, where chalybeates are hurtful, it has been ſaid that it ſeldom fails of exciting the menſtrual evacuations, and removing the ill conſequences of their ſuppreſſion. A tea ſpoonful of the tincture may be taken twice a-day in warm water or any other convenient vehicle.

TINCTURA HYOSCIAMI NIGRI. *Ed.*

Tincture of Henbane.

Take of

The leaves of henbane, dried, one ounce;
Diluted alcohol, eight ounces.

Digeſt for ſeven days, and ſtrain through paper.

This tincture, although not yet come into general uſe, is a valuable anodyne, and in many caſes may be ſubſtituted with advantage for the tincture of opium, eſpecially where the latter produces obſtinate conſtipation, or, inſtead of its uſual ſoporific and ſedative effects, it cauſes uneaſineſs, reſtleſſneſs, and univerſal irritation.

TINCTURA KINO. *Edin. Dub.*

Tincture of Kino.

Take of

Kino, (in powder, *Dub.*) two ounces;
Diluted alcohol, a pound and a half.

Digeſt ſeven days, and ſtrain through paper.

We have already ſtated our reaſons for believing kino to be a ſpecies of tanin. This is certainly a very aſtringent tincture, and will be found an excellent medicine in obſtinate diarrhœas and in lienteria.

TINCTURA LAURI CINNAMOMI. *Ed.*

Tincture of Cinnamon.

Take of

Cinnamon, three ounces;
Diluted alcohol, two pounds and a half.

Macerate for ſeven days, and ſtrain through paper.

Tinctura Cinnamomi. *Lond. Dub.*

Tincture of Cinnamon.

Take of

Cinnamon, bruiſed, one ounce and a half, (three ounces and a half, *Dub.*)
Proof ſpirit of wine, one pint, (two pints, *Dub.*)

Digeſt for ten days, and ſtrain.

The tincture of cinnamon poſſeſſes the aſtringent virtues of the cinnamon, as well as its aromatic cordial ones; and in this reſpect it differs from the diſtilled waters of that ſpice.

TINCTURA LAURI CINNAMOMI COMPOSITA; olim, TINCTURA AROMATICA. *Ed.*

Compound Tincture of Cinnamon, formerly *Aromatic Tincture.*

Take of
Cinnamon,
Leſſer cardamom ſeeds, each one ounce;
Long pepper, two drachms;
Diluted alcohol, two pounds and a half.
Macerate for ſeven days, and filter the tincture through paper.

TINCTURA CINNAMOMI COMPOSITA. *Lond.* TINCTURA AROMATICA. *Dub.*

Aromatic Tincture.

Take of
Cinnamon, bruiſed, ſix drachms;
Leſſer cardamom ſeeds, without the capſules, one drachm, (three drachms, *Lond.*)
Long pepper, in powder,
Ginger, in powder, two drachms;
Proof ſpirit, two pounds, (two pints, *Lond.*)
Mix and digeſt for ſeven days, then ſtrain.

IN their formula, the Dublin and London colleges diminiſh the quantity of cardamom ſeeds, and ſubſtitute for it a proportion of ginger. This makes no alteration on the virtues of the preparation, which is a very warm aromatic, too hot to be given without dilution. A tea ſpoonful or two may be taken in wine, or any other convenient vehicle, in languors, weakneſs of the ſtomach, flatulencies, and other ſimilar complaints; and in theſe caſes it is often employed with advantage.

Off. prep.—Æther ſulph. cum alcohole aromat.

TINCTURA LAVENDULÆ COMPOSITA. *Dub.* SPIRITUS LAVANDULÆ SPICÆ COMPOSITUS. *Edin.*

Compound Tincture, or Spirit, of Lavender.

Take of
Spirit of lavender, three pounds;
Spirit of roſemary, one pound;
Cinnamon, one ounce, (half an ounce, *Dub.*)
Cloves, two drachms;
Nutmeg, half an ounce;
Red ſaunders wood, three drachms.
Macerate for ſeven days, and filter.

SPIRITUS LAVENDULÆ COMPOSITA. *Lond.*
Compound Spirit of Lavender.

Take of
Spirit of lavender, three pints;
Spirit of roſemary, one pint;
Cinnamon, bruiſed,
Nutmegs, bruiſed, of each half an ounce;
Red ſaunders, one ounce.
Digeſt for ten days, and ſtrain.

THESE preparations do not differ materially. They are grateful cordials, of which from ten to a hundred drops may be conveniently taken dropt upon ſugar. It does not appear very clearly whether they ſhould be conſidered as ſpirits or tinctures; for although the ſpirit of lavender be the predominant ingredient, yet the mode of preparation is that of a tincture, and the ſpirit as a menſtruum diſſolves aſtringent colouring, and other ſubſtances, which would not riſe with it in diſtillation.

TINCTURA MELOES VESICATORII. *Ed.* TINCTURA CANTHARIDUM. *Dub.*
Tincture of Cantharides.

Take of
Cantharides, bruiſed, one drachm, (two drachms, *Dub.*)
Proof ſpirit, one pound, (two pounds, *Dub.*)
Mix and digeſt for ſeven days; then ſtrain through paper.

TINCTURA CANTHARIDIS. *Lond.*
Tincture of Spaniſh Flies.

Take of
Bruiſed cantharides, two drachms;
Cochineal, powdered, half a drachm;
Proof ſpirit, one pint and a half.
Digeſt for eight days, and ſtrain.

THIS tincture contains the active principle of the cantharides, whatever it may be. It is applied externally as a ſtimulant and rubefacient, and is ſometimes given internally, in doſes of from ten to twenty drops, as a diuretic.

TINCTURA MIMOSÆ CATECHU; olim, TINCTURA JAPONICA. *Ed.* TINCTURA CATECHU. *Lond.*
Tincture of Catechu.

Take of
Extract of catechu, three ounces;

Cinnamon, two ounces;
Diluted alcohol, two pounds and a half, (two pints, *Lond.*)
Digeſt for eight days, (ten days, *Lond.*) and ſtrain through paper.

The cinnamon is a very uſeful addition to the catechu, not only as it warms the ſtomach, &c. but likewiſe as it improves the roughneſs and aſtringency of the other.

This tincture is of ſervice in all kinds of defluxions, catarrhs, looſeneſſes, uterine fluxes, and other diſorders, where aſtringent medicines are indicated. Two or three tea ſpoonfuls may be taken every now and then in red wine, or any other proper vehicle.

TINCTURA MOSCHI. *Dub.*

Tincture of Muſk.

Take of
Muſk, two drachms;
Rectified ſpirit of wine, one pound.
Mix and macerate for ſeven days, and ſtrain.

Rectified ſpirit is the moſt complete menſtruum for muſk; but in this form it is often impoſſible to give ſuch a quantity of the muſk as is neceſſary for our purpoſe; and hence this article is more frequently employed under the form of julep or bolus.

TINCTURA MYRRHÆ. *Ed. Lond. Dub.*

Tincture of Myrrh.

Take of
Myrrh, in powder, three ounces;
Alcohol, twenty ounces, (half a pint, *Lond.* two pounds, *Dub.*)
Proof ſpirit of wine, a pint and a half, *Lond.*
Water, ten ounces, *Ed.*
Digeſt for ſeven days, (eight days, *Lond.*) and ſtrain through paper.

Tincture of myrrh is recommended internally as a cardiac, for removing obſtructions, particularly thoſe of the uterine veſſels, and reſiſting putrefaction. The doſe is from fifteen drops to forty or more. The medicine may perhaps be given in theſe caſes to advantage; though with us, it is more commonly uſed externally, for cleanſing foul ulcers, and promoting the exfoliation of carious bones.

Off. prep.—Tinct. ſabinæ comp. *Lond.* Trochiſci glycyr. cum opio, *Dub.*

TINCTURA OPII, SIVE THEBAICA; vulgo, LAUDANUM LIQUIDUM. *Ed. Dub.*

Tincture of Opium, or *Thebaic Tincture,* commonly called *Liquid Laudanum.*

Take of
  Opium, two ounces;
  Diluted alcohol, two pounds.
Digeſt ſeven days, and filter through paper.

Lond.

Take of
  Hard purified opium, powdered, ten drachms;
  Proof ſpirit of wine, one pint.
Digeſt for ten days, and ſtrain.

THESE are very elegant liquid opiates; and as they are now directed, they are of the ſame ſtrength, or contain the ſame proportion, of opium; a drachm of each tincture containing, as is found by evaporating the tincture, three grains and a half of pure opium.

It is to be regretted that theſe tinctures are not ſo well adapted for keeping as could be wiſhed: when long kept, a part of the opium is gradually depoſited from both, and conſequently the tinctures become weaker: the part which thus ſeparates, amounts ſometimes, as it is ſaid, to near one fourth of the quantity of opium at firſt diſſolved.

TINCTURA OPII CAMPHORATA. *Lond.* Olim, ELIXIR PAREGORICUM. *Dub.*

Camphorated Tincture of Opium. Paregoric Elixir.

Take of
  Hard purified opium,
  Flowers of benzoin, of each one drachm;
  Camphor, two ſcruples;
  Eſſential oil of aniſeed, one drachm;
  Proof ſpirit of wine, two pints.
Digeſt for ten days, (mix and macerate for ſeven days, *Dub.*) and ſtrain.

IN this formula the virtues of the opium and camphor are combined. It gets an agreeable flavour from the acid of benzoin and eſſential oil. The latter will alſo render it more ſtimulating; but whether it derives any ſalutary virtues from the former, we do not know. It was originally preſcribed under the title of Elixir Aſthmaticum, which it does not ill deſerve. It contributes to allay the tickling which provokes frequent coughing; and at the ſame time it is ſuppoſed to open the breaſt, and give greater liberty of breathing. It is given to children againſt the chincough, &c. from five drops to twenty: to adults, from twenty to an hundred. Half an ounce, by meaſure, contains about a grain of opium.

TINCTURA RHEI PALMATI. *Ed.*
Tincture of Rhubarb.

Take of
Rhubarb, three ounces;
Leſſer cardamom ſeeds, half an ounce;
Diluted alcohol, two pounds and a half.
Digeſt for ſeven days, and ſtrain through paper.

TINCTURA RHABARBARI. *Lond. Dub.*
Tincture of Rhubarb. Lond.

Take of
Rhubarb, cut into pieces, two ounces;
Leſſer cardamom ſeeds, bruiſed, (and huſked, *Dub.*)
Saffron, two drachms;
Proof ſpirit of wine, two pints, (two pounds, *Dub.*)
Digeſt for eight days, (ſeven days, *Dub.*) and ſtrain.

TINCTURA RHABARBARI COMPOSITA. *Lond.*
Compound Tincture of Rhubarb.

Take of
Rhurbarb, ſliced, two ounces;
Liquorice root, bruiſed, half an ounce;
Ginger, powdered,
Saffron, each two drachms;
Diſtilled water, one pint;
Proof ſpirit of wine, twelve ounces, by meaſure.
Digeſt for fourteen days, and ſtrain.

TINCTURA RHEI CUM ALOE; olim, ELIXIR SACRUM. *Ed.*
Tincture of Rhubarb with Aloes, commonly called *Sacred Elixir.*

Take of
Rhubarb, ten drachms;
Socotorine aloes, ſix drachms;
Leſſer cardamom ſeeds, half an ounce;
Diluted alcohol, two pounds and a half.
Digeſt for ſeven days, and ſtrain through paper.

TINCTURA RHEI CUM GENTIANA; olim, TINCTURA RHEI AMARA. *Ed.*

Tincture of Rhubarb with Gentian, formerly *Bitter Tincture of Rhubarb.*

Take of
  Rhubarb, two ounces;
  Gentian root, half an ounce;
  Diluted alcohol, two pounds and a half.
Digeſt for ſeven days, and then ſtrain the tincture through paper.

ALL the foregoing tinctures of rhubarb are deſigned as ſtomachics and corroborants, as well as purgatives: ſpiritous liquors excellently extract thoſe parts of the rhubarb in which the two firſt qualities reſide, and the additional ingredients conſiderably promote their efficacy. In weakneſs of the ſtomach, indigeſtion, laxity of the inteſtines, diarrhœas, colic, and other ſimilar complaints, theſe medicines are frequently of great ſervice.

TINCTURA SABINÆ COMPOSITA. *Lond.*

Compound Tincture of Savin.

Take of
  Extract of ſavin, one ounce;
  Tincture of caſtor, one pint;
  ——— myrrh, half a pint.
Digeſt till the extract of ſavin be diſſolved, and then ſtrain.

THIS preparation is improved from one deſcribed in ſome former diſpenſatories under the name of Elixir Uterinum. It is ſaid to be a medicine of great importance in uterine obſtructions, and in hypochondriacal caſes; though, poſſibly, means might be contrived of ſuperadding more effectually the virtues of ſavin to a tincture of myrrh and caſtor. It may be given from five drops to twenty or thirty, or more, in any ſuitable vehicle.

TINCTURA SAPONIS; vulgo, LINIMENTUM SAPONACEUM. *Ed.*

Tincture of Soap, formerly *Saponaceous Liniment.*

Take of
  Soap, four ounces;
  Camphor, two ounces;
  Volatile oil of roſemary, half an ounce.
  Alcohol, two pounds.

Digeſt the ſoap in the alcohol for three days; then add to the filtered liquor the camphor and the oil, agitating them diligently.

LINIMENTUM SAPONIS COMPOSITUM. *Lond.*
Compound Soap Liniment.

Take of
Soap, three ounces;
Camphor, one ounce;
Spirit of roſemary, one pint.

Digeſt the ſoap in the ſpirit of roſemary until it be diſſolved, and add to it the camphor.

LINIMENTUM SAPONACEUM. *Dub.*
Saponaceous Liniment.

Take of
Caſtile ſoap, two ounces;
Camphor, one ounce;
Alcohol,
Water, each eight ounces;
Eſſential oil of roſemary, two ſcruples.

Diſſolve the ſoap in the water over a gentle fire; ſtrain the liquor through linen; and when it is almoſt cold, add the camphor and oil diſſolved in the alcohol.

Off. prep.—Linim volat. *Dub.*

TINCTURA SAPONIS CUM OPIO; olim, LINIMENTUM ANODYNUM. *Ed.*
Tincture of Soap with Opium, formerly *Anodyne Liniment.*

This is prepared in the ſame way, and from the ſame ſubſtances, as the ſimple tincture of ſoap, but with the addition from the beginning of one ounce of opium.

THESE tinctures are only uſed externally, and poſſeſs great efficacy in removing local pains when rubbed on the affected part.

TINCTURA SCILLÆ. *Lond. Dub.*
Tincture of Squill.

Take of
Squills, freſh dried, four ounces;
Proof ſpirit of wine, two pints, (two pounds, *Dub.*)

Digeſt for eight days, and pour off the liquor, *Lond.*

(Mix and digeſt for ſeven days; then remove from the fire, and when the feces have ſubſided, pour off the pure liquor, *Dub.*)

The active principle of ſquills is ſoluble in alcohol, and there are caſes in which a tincture may be uſeful.

TINCTURA TOLUIFERÆ BALSAMI; olim, TINCTURA TOLUTANA. *Ed.* TINCTURA BALSAMI TOLUTANI. *Lond. Dub.*

Tincture of the Balſam of Tolu.

Take of

Balſam of Tolu, an ounce and a half, (one ounce, *Dub.*)

Alcohol, one pint, (one pound, *Dub. Ed.*)

Digeſt until the balſam be diſſolved; and then ſtrain the tincture through paper.

This ſolution of balſam of Tolu poſſeſſes all the virtues of the balſam itſelf. It may be taken internally, with the ſeveral intentions for which that valuable balſam is proper, to the quantity of a tea ſpoonful or two, in any convenient vehicle. Mixed with the plain ſyrup of ſugar, it forms an elegant balſamic ſyrup.

Off. prep.—Syrupus Tol. balſ. *Ed.* Elect. catechu, *Dub.* Trochiſci glycr. cum opio, *Ed. Dub.*

TINCTURA VALERIANÆ. *Lond.*

Tincture of Valerian.

Take of

The root of wild valerian, in coarſe powder, four ounces;

Proof ſpirit of wine, two pints.

Digeſt with a gentle heat for eight days, and ſtrain.

The valerian root ought to be reduced to a pretty fine powder, otherwiſe the ſpirit will not ſufficiently extract its virtues. The tincture proves of a deep colour, and conſiderably ſtrong of the valerian; though it has not been found to anſwer ſo well in the cure of epileptic diſorders as the root in ſubſtance, exhibited in the form of powder or bolus. The doſe of the tincture is, from half a ſpoonful to a ſpoonful, or more, two or three times a-day.

TINCTURA VERATRI ALBI. *Ed.*

Tincture of White Hellebore.

Take of

White hellebore root, eight ounces;

Diluted alcohol, two pounds and a half.
Digeſt them together for ſeven days, and filter the tincture through paper.

This tincture is ſometimes uſed for aſſiſting cathartics, &c. and as an emetic in apoplectic and maniacal diſorders. It may likewiſe be ſo managed, as to prove a powerful alterative and deobſtruent, in caſes where milder remedies have little effect. But a great deal of caution is requiſite in its uſe: the doſe, at firſt, ought to be only a few drops; if conſiderable, it proves violently emetic or cathartic.

TINCTURA ZINGIBERIS. *Lond.*

Tincture of Ginger.

Take of
Ginger, powdered, two ounces;
Proof ſpirit, two pounds.
Digeſt in a gentle heat for eight days, and ſtrain.

This ſimple tincture of ginger is a warm cordial, and is rather intended as a uſeful addition, in the quantity of a drachm or two, to purging mixtures, than for being uſed alone.

CHAP. XXXI.

TINCTURES made with ETHEREAL SPIRITS.

We have claſſed theſe tinctures by themſelves, becauſe they are more ſtrongly characteriſed by the nature of the menſtruum than of the ſubſtances diſſolved in it. Indeed, the ethereal ſpirits are uſed in theſe inſtances, not to diſſolve bodies which would reſiſt the action of alcohol and water, but for the ſake of their own direct action on the body.

TINCTURA ALOES ÆTHEREA. *Ed.*

Ethereal Tincture of Aloes.

Take of
Myrrh,

Socotorine aloes, of each an ounce and a half;
Engliſh ſaffron, one ounce;
Sulphuric ether with alcohol, one pound.
Digeſt the myrrh with the liquor for four days, in a cloſe veſſel; then add the ſaffron and aloes.
Digeſt again for four days, and, when the feces have ſubſided, pour off the tincture.

THIS tincture agrees generally in its effects with the other tinctures of aloes, the only difference ariſing from the more penetrating and ſtimulating nature of the menſtruum itſelf.

ÆTHER SULPHURICUS CUM ALCOHOLE AROMATICUS. *Edin.*

Aromatic Sulphuric Ether with Alcohol.

This is made of the ſame aromatics, and in the ſame manner, as the compound tincture of cinnamon; except that, in place of the alcohol, ſulphuric ether with alcohol is employed.

THIS is deſigned for perſons whoſe ſtomachs are too weak to bear the following acid tincture: to the taſte, it is gratefully aromatic, without any perceptible acidity.

ACIDUM SULPHURICUM AROMATICUM. *Edin.*

Aromatic Sulphuric Acid.

Take of
Alcohol, two pounds;
Sulphuric acid, ſix ounces.
Drop the acid gradually into the alcohol.
Digeſt the mixture with a very gentle heat in a cloſe veſſel for three days, and then add of
Cinnamon, an ounce and a half;
Ginger, one ounce.
Digeſt again in a cloſe veſſel for ſix days, and then filter the tincture through paper placed in a glaſs funnel.

ALTHOUGH the name given to this preparation by the college does not ſanction its arrangement with the ethereal tinctures, yet we have ventured to place it here, from the belief that the alcohol is completely or partially changed, by the digeſtion with the acid, into an ethereal ſpirit, and that the principal difference between this and the preceding tincture conſiſts in the preſence of the acid, which is not to be conſidered as the menſtruum by which the tincture is formed, but as an acid mixed with the ethereal tincture.

This is a valuable medicine in weakneſs and relaxations of the ſtomach, and decays of conſtitution, particularly in thoſe which proceed from irregularities, which are accompanied with ſlow febrile ſymptoms, or which follow the ſuppreſſion of intermittents. It frequently ſucceeds, after bitters and aromatics by themſelves had availed nothing; and, indeed, great part of its virtues depend on the ſulphuric acid; which, barely diluted with water, has, in thoſe caſes where the ſtomach could bear the acidity, produced happy effects.

It is very uſefully conjoined with cinchona, and other tonic barks, both as covering their diſagreeable taſte, and as coinciding with them in virtue. It may be given in doſes of ten to thirty drops, or more, ſeveral times a-day.

CHAP. XXXII.

AMMONIATED or VOLATILE TINCTURES.

Ammonia, like ether, is ſo powerful an agent on the living ſyſtem, that we think it gives a peculiar character to the compoſitions into which it enters. They are all highly ſtimulating and pungent, and apt to excite diaphoreſis. As ammonia exerts conſiderable and peculiar powers as a ſolvent, theſe tinctures muſt never be combined in preſcription with any thing acid, which would not only neutralize the ammonia, and deſtroy its peculiar action on the living ſyſtem, but would precipitate whatever was diſſolved by its agency.

LINIMENTUM CAMPHORÆ COMPOSITUM. *Lond.*

Compound Camphor Liniment.

Take of
Camphor, two ounces;
Water of pure ammonia, ſix ounces;
Spirit of lavender, ſixteen ounces.

Mix the water of ammonia with the ſpirit; and diſtil from a glaſs retort, with a ſlow fire, ſixteen ounces. Then diſſolve the camphor in the diſtilled liquor.

LINIMENTUM CAMPHORATUM. *Dub.*

Camphorated Liniment.

Take of
Camphor, three ounces;
Ley of aërated volatile alkali, ten ounces;
Spirit of lavender, two pounds.
Mix the ley and the ſpirit; and diſtil from a glaſs retort, with a gentle heat, two pounds. Then diſſolve the camphor in the diſtilled liquor.

These compoſitions are more pungent and penetrating than the ſolutions of camphor in alcohol. In the quarto impreſſion of their pharmacopœia, the London college employed the ſolution of carbonated ammonia, but changed it in the octavo edition for the water of pure ammonia, which is certainly an improvement.

LINIMENTUM VOLATILE. *Dub.*

Volatile Liniment.

Take of
The aromatic ſpirit of volatile alkali, one ounce;
Liniment of ſoap, two ounces.
Mix them.

This is an entirely different compoſition from the volatile liniment of the Edinburgh and London pharmacopœias. The latter is a ſoap formed of ammonia and fixed oil, whereas the preſent is an ammoniated tincture of camphor, ſoap of ſoda, and volatile oils. In its effects it differs from the ſoap-liniment of the Dublin college only in being more ſtimulating.

ALCOHOL AMMONIATUM AROMATICUM, SIVE SPIRITUS AMMONIÆ AROMATICUS. *Ed.*

Aromatic Ammoniated Alcohol, or *Aromatic Spirit of Ammonia.*

Take of
Ammoniated alcohol, eight ounces;
Volatile oil of roſemary, one drachm and a half;
Volatile oil of lemon-peel, one drachm.
Mix them that the oils may be diſſolved.

SPIRITUS AMMONIÆ COMPOSITUS. *Lond.*
Compound Spirit of Ammonia.

Take of
Spirit of ammonia, two pints;
Eſſential oil of lemon,
———— cloves, of each two drachms.
Mix them.

SPIRITUS ALKALI VOLATILIS AROMATICUS. *Dub.*
Aromatic Spirit of Volatile Alkali.

Take of
Spirit of volatile alkali, two pounds;
Eſſential oil of lemon,
———— nutmeg, of each two drachms.
Mix them.

VOLATILE oils are diſſolved readily and completely by ſpirit of ammonia: and medicines of this kind might be prepared extemporaneouſly, by dropping any proper eſſential oil into ſpirit of ammonia, which will immediately diſſolve the oil without the aſſiſtance of diſtillation. But it is perhaps preferable that they ſhould be kept in the ſhops ready mixed.

All the foregoing compoſitions turn out excellent ones, provided the oils are good. The doſe is from five or ſix drops to ſixty, or more.

Ammonia, thus united with aromatics, is not only more agreeable in flavour, but likewiſe more acceptable to the ſtomach, and leſs acrimonious than uncombined.

Off. prep.—Linim volat. *Dub.* Tinct. cinchon. ammon. *Lond.* Tinctura guaiaci, *Lond. Dub.* Tinct. vol. ammon. *Lond. Dub.*

SPIRITUS AMMONIÆ SUCCINATUS. *Lond.*
Succinated Spirit of Ammonia.

Take of
Alcohol, one ounce, by weight;
Water of pure ammonia, four ounces, by meaſure;
Rectified oil of amber, one ſcruple, by weight;
Soap, ten grains.
Digeſt the ſoap and oil of amber in the alcohol till they be diſſolved: then add the water of pure ammonia, and mix them by ſhaking.

THIS preparation is intended as a ſubſtitute for Eau de Luce, which was formerly imported entirely from Paris. It is now, we believe, prepared alſo by the chemiſts and druggiſts in London; but without ſome peculiar manipulation, which is kept ſecret, the above formula does not ſucceed in giving the liquor that permanent milky opacity, which is deemed eſſential to good Eau de Luce, for it becomes more or leſs tranſparent by keeping. This fancied perfection is, however, in a medical point of view, immaterial; and whether it be opaque or tranſparent, it is an excellent analeptic remedy, and may be uſed in the ſame circumſtances, and in the ſame doſes, as the ſpirit of ammonia itſelf.

TINCTURA CASTOREI COMPOSITA. *Ed.*

Compound Tincture of Caſtor.

Take of
  Ruſſia caſtor, one ounce;
  Aſſa fœtida, half an ounce;
  Ammoniated alcohol, one pound.
Digeſt for ſeven days in a cloſe ſtopped phial, and filter through paper.

This compoſition is a medicine of real efficacy, particularly in hyſterical diſorders, and the ſeveral ſymptoms which accompany them. The ſpirit here uſed is an excellent menſtruum, both for the caſtor and the aſſa fœtida, and greatly adds to their virtues.

TINCTURA CINCHONÆ AMMONIATA. *Lond.*

Ammoniated Tincture of Cinchona.

Take of
  Cinchona, powdered, four ounces;
  Compound ſpirit of ammonia, two pints.
Digeſt in a cloſe veſſel for ten days, and ſtrain.

We are not acquainted with this tincture; but from our knowledge of the active principles of cinchona bark, we are not diſpoſed to think it a very judicious preparation; for the nature of the menſtruum is ſo ſtimulating, that little effect can be expected from any portion of the bark it is capable of diſſolving.

TINCTURA GUAIACI AMMONIATA. *Ed.*

Ammoniated Tincture of Guaiac.

Take of
  Gum guaiac, four ounces;
  Ammoniated alcohol, one pound and a half.
Digeſt for ſeven days, and filter through paper.

TINCTURA GUAIACI. *Lond.* TINCT. GUAIACI VOLATILIS. *Dub.*
Tincture of Guaiac. Volatile Tincture of Guaiac.

Take of
- Gum guaiacum, four ounces;
- Compound ſpirit of ammonia, a pint and a half, (one pound and a half, *Dub.*)

Digeſt for three days, and ſtrain, *Lond.*
Mix and macerate for ſeven days, in a veſſel cloſely covered, then filter, *Dub.*

THESE are very elegant and efficacious tinctures; the ammoniated ſpirit readily diſſolving the reſin, and at the ſame time promoting its medicinal virtue. In rheumatic caſes, a tea, or even table, ſpoonful, taken every morning and evening in any convenient vehicle, particularly in milk, has proved of ſingular ſervice.

TINCTURA OPII AMMONIATA; olim, ELIXIR PAREGORICUM. *Ed.*
Ammoniated Tincture of Opium, formerly *Paregoric Elixir.*

Take of
- Benzoic acid,
- Engliſh ſaffron, of each three drachms;
- Opium, two drachms;
- Eſſential oil of aniſeed, half a drachm;
- Ammoniated alcohol, ſixteen ounces.

Digeſt for ſeven days, in a cloſe veſſel, and ſtrain.

THIS is a preparation of conſiderable efficacy in many ſpaſmodic diſeaſes, as chincough, &c. the ammonia removing the ſpaſm immediately, while the opium tends to prevent its return. Each drachm contains about a grain of opium.

TINCTURA VALERIANÆ AMMONIATA. *Lond. Dub.*
Ammoniated Tincture of Valerian.

Take of
- Wild valerian, in coarſe powder, four ounces;
- Compound ſpirit of ammonia, two pints.

Digeſt for eight days, (ſeven days, in a veſſel cloſely covered, *Dub.*) and ſtrain.

THE compound ſpirit of ammonia is here an excellent menſtruum, and at the ſame time conſiderably promotes the virtues of the valerian, which in ſome caſes wants aſſiſtance of this kind. The doſe may be a tea ſpoonful or two.

CHAP. XXXIII.

MEDICATED WINES.

Parmentier has occupied thirty-two pages of the Annales de Chimie, to prove that wine is an extremely bad menſtruum for extracting the virtues of medicinal ſubſtances. His argument, (for there is but one), is, that by the infuſion of vegetable ſubſtances in wine, its natural tendency to decompoſition is ſo much accelerated, that at the end of the proceſs, inſtead of wine, we have only a liquor containing the elements of bad vinegar. As a ſolvent, diluted alcohol perfectly ſuperſedes the uſe of wine; and if we wiſh to uſe wine to cover the taſte, or to aſſiſt the operation of any medicine, M. Parmentier propoſes, that a tincture of the ſubſtance ſhould be extemporaneouſly mixed with wine as a vehicle.

Notwithſtanding this argument appears to us to have great weight, we ſhall give to the medicated wines, retained in the pharmacopœias, the characters they ſtill generally poſſeſs.

VINUM ALOES SOCOTORINÆ; vulgo, Tinctura Sacra. *Ed.*

Wine of Socotorine Aloes, commonly called *Sacred Tincture*.

Take of
- Socotorine aloes, one ounce;
- Leſſer cardamom ſeeds,
- Ginger, each one drachm;
- Spaniſh white wine, two pounds.

Digeſt for ſeven days, ſtirring now and then, and afterwards ſtrain.

Vinum Aloeticum. *Dub.*

Aloetic Wine.

Take of
- Socotorine aloes, four ounces;

Canella alba, two ounces;
Spaniſh white wine, four pounds.

Powder the aloes and canella alba ſeparately, then mix and pour on the wine, afterwards digeſt for fourteen days, frequently ſhaking the veſſel; and, laſtly, filter the liquor.

VINUM ALOES. *Lond.*
Wine of Aloes.

Take of
Socotorine aloes, eight ounces;
Canella alba, two ounces;
Spaniſh white wine, ſix pints;
Proof ſpirit, two pints.

Powder the aloes and canella ſeparately; mix them, and pour on the wine and ſpirit: digeſt for fourteen days, now and then ſhaking them; and ſtrain.

It is proper to mix white ſand, cleanſed from impurities, with the powder, in order to prevent the moiſtened aloes from ſticking together.

THIS medicine has long been in great eſteem, not only as a cathartic, but likewiſe as a ſtimulus.

It appears from long experience to be a medicine of excellent ſervice. The doſe, as a purgative, is from one to two ounces. It may be introduced into the habit, ſo as to be productive of excellent effects, as an alterant, by giving it in ſmall doſes, at proper intervals: thus managed, it does not for a conſiderable time operate remarkably by ſtool: but at length proves purgative, and occaſions a lax habit of much longer continuance than that produced by the other common cathartics.

VINUM GENTIANÆ COMPOSITUM; vulgo, VINUM AMARUM. *Ed.*
Compound Wine of Gentian, commonly called *Bitter Wine.*

Take of
Gentian root, half an ounce;
Peruvian bark, one ounce;
Seville orange peel, dried, two drachms;
Canella alba, one drachm;
Diluted alcohol, four ounces;
Spaniſh white wine, two pounds and a half.

Firſt pour the ſpirit on the root and bark cut and bruiſed, and after twenty-four hours add the wine; then macerate for ſeven days, and ſtrain.

This wine is intended to ſupply the place of the *Tinctura ad ſtomachicos*, as it was formerly called. Wine is a menſtruum fully capable of extracting the active powers of the different ingredients; and it ſupplies us with a very uſeful and elegant ſtomachic medicine, anſwering the purpoſes intended much better than the celebrated elixir of Van Helmont, and other unchemical and uncertain preparations, which had formerly a place in our pharmacopœias.

VINUM IPECACUANHÆ. *Lond. Dub.*

Wine of Ipecacuanha.

Take of
  The root of ipecacuan, bruiſed, two ounces;
  Spaniſh white wine, two pints, (two pounds, *Dub.*)
Digeſt for ten days, (ſeven days, *Dub.*) and ſtrain.

Ed.

Take of
  Ipecacuan, in powder, one ounce;
  Spaniſh white wine, fifteen ounces;
Macerate for ſeven days, and filter through paper.

Both theſe wines are very mild and ſafe emetics, and equally ſerviceable, in dyſenteries alſo, with the ipecacuanha in ſubſtance; this root yielding nearly all its virtues to the Spaniſh white wine. The common doſe is an ounce, more or leſs, according to the age and ſtrength of the patient.

VINUM NICOTIANÆ TABACI. *Ed.*

Tobacco Wine.

Take of
  The dried leaves of tobacco, one ounce;
  Spaniſh white wine, one pound.
Macerate for ſeven days, and then ſtrain the liquor.

Wine ſeems to extract more fully the active principles of the tobacco than either water or ſpirit taken ſeparately.

VINUM RHEI PALMATI. *Ed.*

Rhubarb Wine.

Take of
  Rhubarb, ſliced, two ounces;
  Canella alba, one drachm;
  Diluted alcohol, two ounces;

Spaniſh white wine, fifteen ounces.
Macerate for ſeven days, and ſtrain through paper.

VINUM RHABARBARI. *Lond.*
Wine of Rhubarb.

Take of
Sliced rhubarb, two ounces and a half;
Leſſer cardamom ſeeds, bruiſed and huſked, half an ounce;
Saffron, two drachms;
Spaniſh white wine, two pints;
Proof ſpirit, half a pint.
Digeſt for ten days, and ſtrain.

BY aſſiſting the ſolvent power of the wine, the proof ſpirit in the above formulæ is a very uſeful addition. This is a warm, cordial, laxative medicine. It is uſed chiefly in weakneſs of the ſtomach and bowels, and ſome kinds of looſeneſſes, for evacuating the offending matter, and ſtrengthening the tone of the viſcera. It may be given in doſes of from half a ſpoonful to three or four ſpoonfuls or more, according to the circumſtances of the diſorder, and the ſtrength of the patient.

CHAP. XXXIV.

EXTRACTS and RESINS.

EXTRACT in pharmacy has long been uſed, in the common and true acceptation of the term, to expreſs a thing extracted, and therefore it was applied to ſubſtances of all kinds which were extracted from heterogeneous bodies, by the action of any menſtruum, and again reduced to a conſiſtent form, by the evaporation of that menſtruum. Lately, however, Extract has been uſed in a different and much more limited ſenſe, as the name for a peculiar principle, which is often indeed contained in extracts, and which before had no proper appellation. It is in the former ſenſe that we employ it here, and in which we wiſh it to be only uſed, while a new word ſhould be invented as the name of the new ſubſtance. Till a better be propoſed, we ſhall call it *extractive.*

Extracts are of various kinds, according to the nature of the ſubſtances from which they are obtained, and the menſtruum employed; but they commonly conſiſt of gum, ſugar, extractive, tannin, gallic acid, or reſin, or ſeveral of them mixed in various proportions. The menſtrua moſt commonly employed are water and alcohol. The former is capable of extracting all the ſubſtances enumerated, except the reſin, and the latter all except the gum. Wine is alſo ſometimes employed, but very improperly; for as a ſolvent it can only act as a mixture of alcohol and water, and the principles which it leaves behind on evaporation are rather injurious than of advantage to the extract.

Water is the menſtruum moſt economically employed in making extracts, as it is capable of diſſolving all the active principles except reſin, and can have its ſolvent powers aſſiſted by a conſiderable degree of heat.

Watery extracts are prepared by boiling the ſubject in water, and evaporating the ſtrained decoction to a thick conſiſtence.

It is indifferent, with regard to the medicine, whether the ſubject be uſed freſh or dry; ſince nothing that can be preſerved in this proceſs will be loſt by drying. With regard to the facility of extraction, there is a very conſiderable difference; vegetables in general giving out their virtues more readily when moderately dried than when freſh.

Very compact dry ſubſtances ſhould be reduced into exceedingly ſmall parts, previous to the affuſion of the menſtruum.

The quantity of water ought to be no greater than is neceſſary for extracting the virtues of the ſubject. This point, however, is not very eaſily aſcertained; for although ſome of the common principles of extracts be ſoluble in a very ſmall proportion of water, there are others, ſuch as the tannin, of which water can diſſolve only a certain proportion, and cannot be made to take up more by any length of boiling, and we have no very good method of knowing when we have uſed a ſufficient quantity of water; for vegetable ſubſtances will continue to colour deeply ſucceſſive portions of water boiled with them, long after they are yielding nothing to it but colouring matter. Perhaps one of the beſt methods is to boil the ſubject in ſucceſſive quantities of water, as long as the decoctions form a conſiderable precipitate with the teſt which is proper for detecting the ſubſtance we are extracting, ſuch as a ſolution of gelatin for tannin, of alum for extractive, &c.

"The decoctions are to be depurated by colature; and after-
"wards ſuffered to ſtand for a day or two, when a conſiderable
"quantity of ſediment is uſually found at the bottom. If the
"liquor poured off clear be boiled down a little, and afterwards
"ſuffered to cool again, it will depoſite a freſh ſediment, from
"which it may be decanted before you proceed to finiſh the eva-
"poration. The decoctions of very reſinous ſubſtances do not re-
"quire this treatment, and are rather injured by it; the reſin
"ſubſiding along with the inactive dregs."

Such were the directions given in the former editions of this work for the depuration of the decoctions, and we have inſerted them at full length, becauſe, although we doubt very much of their propriety, our reaſons for ſo doing are ſcarcely more than hypothetical. We would adviſe the decoctions to be evaporated after they have been filtered boiling hot, without any further depuration; becauſe ſome of the moſt active principles of vegetable ſubſtances, ſuch as tannin, are much more ſoluble in boiling than in cold water, and becauſe almoſt all of them are very quickly affected by expoſure to the atmoſphere. Therefore, if a boiling decoction, ſaturated with tannin, be allowed to cool, the greateſt part of the very principle on which the activity of the ſubſtance depends will ſeparate to the bottom, and according to the above directions, will be thrown away as ſediment. The ſame objection applies more ſtrongly to allowing the decoction to cool, and depoſite a freſh ſediment, after it has been partially evaporated. Beſides, by allowing the decoctions to ſtand ſeveral days before we proceed to their evaporation, we are in fact allowing the active principles contained in the decoction to be altered by the action of the air, and to be converted into ſubſtances, perhaps inactive, which alſo are thrown away as ſediment.

The evaporation is moſt conveniently performed in broad ſhallow veſſels; the larger the ſurface of the liquor, the ſooner will the aqueous parts exhale. This effect may likewiſe be promoted by agitation.

When the matter begins to grow thick, great care is neceſſary to prevent its burning. This accident, almoſt unavoidable if the quantity be large, and the fire applied as uſual under the evaporating pan, may be effectually prevented, by carrying on the inſpiſſation, after the common manner, no farther than to the conſiſtence of a ſyrup, when the matter is to be poured into ſhallow tin or earthen pans, and placed in an oven, with its door open, moderately heated; which acting uniformly on every part of the liquid, will ſoon reduce it to any degree of conſiſtence required. This may likewiſe be done, and more ſecurely, by ſetting the evaporating veſſel in boiling water; but the evaporation is in this way very tedious.

Alcohol is much too expenſive to be employed as a menſtruum for obtaining extracts, except in thoſe caſes where water is totally inadequate to the purpoſe. Theſe caſes are,

1ſt, When the nature of the extract is very periſhable when diſſolved in water, ſo that it is liable to be decompoſed before the evaporation can be completed, eſpecially if we cannot proceed immediately to the evaporation.

2dly, When water is totally incapable of diſſolving the ſubſtance to be extracted; and,

3dly, When the ſubſtance extracted can bear the heat of boiling alcohol without being evaporated, but would be diſſipated by that of boiling water; that is, when it requires a heat greater than 176°, and leſs than 212°, for its vaporization.

In the laſt caſe, the alcohol muſt be perfectly free from water, becauſe the heat neceſſary to evaporate it at the end of the proceſs would fruſtrate the whole operation. Hence, alſo, the ſubject itſelf ought always to be dry: thoſe ſubſtances which loſe their virtue by drying, loſe it equally on being ſubmitted to this treatment with the pureſt alcohol.

In this way the alcoholic extract of ſome aromatic ſubſtances, as cinnamon, lavender, roſemary, retain a conſiderable degree of their fine flavour.

In the ſecond caſe, the alcohol need not be ſo very ſtrong, becauſe it is ſtill capable of diſſolving reſinous ſubſtances, although diluted with a conſiderable proportion of water.

In the firſt caſe, the alcohol may be ſtill much weaker; or rather, the addition of a ſmall proportion of alcohol to water will be ſufficient to retard or prevent the decompoſition of the decoction.

The alcohol employed in all theſe caſes ſhould be perfectly free from any unpleaſant flvour, leſt it be communicated to the extract.

The inſpiſſation ſhould be performed from the beginning, in the gentle heat of a water-bath. We need not ſuffer the alcohol to evaporate in the air: the greateſt part of it may be recovered by collecting the vapour in common diſtilling veſſels. If the diſtilled ſpirit be found to have brought over any flavour from the ſubject, it may be advantageouſly reſerved for the ſame purpoſes again.

When diluted alcohol is employed, the diſtillation ſhould only be continued as long as alcohol comes over; and the evaporation ſhould be finiſhed in wide open veſſels.

In this chapter we have alſo included the proceſſes intended for purifying inſpiſſated juices and reſinous ſubſtances.

Pure reſins are prepared, by adding to ſpiritous tinctures of reſinous vegetables, a large quantity of water. The reſin, incapable of remaining diſſolved in the watery liquor, ſeparates and falls to the bottom; leaving in the menſtruum ſuch other principles of the plant as the ſpirit might have extracted at firſt along with it. But this is only practiſed for the purpoſe of analyſis.

EXTRACTS made with WATER only.

EXTRACTUM GENTIANÆ LUTEÆ. *Edin.*

Extract of Gentian.

Take of

Gentian root, any quantity.

Having cut and bruiſed it, pour upon it eight times its quantity of water. Boil to the conſumption of one half of the liquor, and ſtrain it by ſtrong expreſſion. Evaporate the decoction immediately to the conſiſtence of thick honey, in a bath of water ſaturated with muriate of ſoda.

Off. prep.—Pil aloet, *Dub. Lond.* Pil ſtib. comp. *Dub.*

In the ſame manner are prepared extracts

Of the roots of	
Liquorice,	*Extractum Glycyrrhizæ glabræ.*
Black Hellebore,	——— *Hellebori nigri.*
Of the leaves of	
Rue,	——— *Rutæ graveolentis.*
Senna,	——— *Caſſiæ Sennæ.*
Of the flowers of	
Chamomile,	——— *Anthemidis nobilis.*
Of the heads of	
White Poppy,	——— *Papaveris albi.*
And of	
Logwood,	——— *Hæmatoxyli Campechenſis.*

EXTRACTA. *Lond.*

Extract of Broom Tops,	*Extractum cacuminis Geniſtæ.*
——— Chamomile,	——— *Chamæmeli.*
——— Gentian,	——— *Gentianæ.*

Off. prep.—Pulv. aloet cum ferro, *Lond.*

Extract of Liquorice,	*Extractum Glycyrrhizæ.*
——— Black Hellebore,	——— *Hellebori nigri.*
——— White Poppy,	——— *Papaveris albi.*
——— Rue,	——— *Rutæ.*
——— Savin,	——— *Sabinæ.*

Off. prep.—Tinct. ſab. comp. *Lond.*

Boil the article in diſtilled water, preſs out the decoction, ſtrain it and ſet it apart that the feces may ſubſide; then boil it again in a water bath ſaturated with ſea ſalt to a conſiſtence proper for making pills.

The ſame kind of bath is to be uſed in the preparation of all the extracts, that the evaporation may be properly performed.

EXTRACTA SIMPLICIORA. *Dub.*

Simple Extracts.

All ſimple extracts, unleſs otherwiſe ordered, are to be prepared according to the following rule:

The parts of the plants ordered are to be boiled in water; the liquor is then to be expreſſed, and after the feces have ſubſided, it is to be filtered; and laſtly, it is to be evaporated with a gentle heat and frequently ſtirred, until it acquire a conſiſtence proper for forming pills.

The ſimple extracts enumerated in this pharmacopœia are,

Extractum Aloes,	Extract of Aloes.
——— *Chamæmeli,*	——— Chamomile.
——— *Gentianæ,*	——— Gentian.
——— *Glycyrrhizæ,*	——— Liquorice.
——— *Hæmatoxyli,*	——— Logwood.
——— *Hellebori nigri,*	——— Black Hellebore.
——— *Jalapæ,*	——— Jalap.
——— *Quercus,*	——— Oak Bark.
——— *Rutæ,*	——— Rue.
——— *Sabinæ,*	——— Savin.

EXTRACTUM CINCHONÆ, SIVE CORTICIS PERUVIANI. *Lond.*

Extract of Cinchona, or Peruvian Bark.

Take of

Peruvian bark, in coarſe powder, one pound;

Diſtilled water, twelve pints.

Boil for an hour or two, and pour off the liquor, which, while hot, will be red and pellucid, but, as it grows cold, will become yellow and turbid. The ſame quantity of water being again poured on, boil the bark as before, and repeat the boiling until the liquor, on becoming cold, remains clear. Then reduce all theſe liquors, mixed together and ſtrained, to a proper thickneſs, by evaporation.

This extract muſt be prepared under two forms; one *ſoft*, and fit for making pills; the other *hard* and pulverizable.

EXTRACTUM CORTICIS PERUVIANI DURUM. *Dub.*

Hard Extract of Peruvian Bark.

Take of

Peruvian bark, in coarſe powder, one pound;
Water, twelve pounds.

Mix and boil to the half; then ſtrain the liquor ſtill boiling. What remains upon the filter is to be again boiled with freſh affuſions of water, as often as may be neceſſary. Laſtly, evaporate all the decoctions, mixed and filtered, after they have cooled, until the extract become ſo hard as to be reducible to powder.

EXTRACTUM CORTICIS PERUVIANI MOLLE. *Dub.*

Soft Extract of Peruvian Bark.

This is prepared in the ſame manner, except that the extract is made no drier than to render it fit for the formation of pills.

EXTRACTUM HÆMATOXYLI, SIVE LIGNI CAMPECHENSIS. *Lond.*

Extract of Logwood.

Take of

Shavings of logwood, one pound.

Boil it four times, or oftener, in a gallon of diſtilled water, to one half; then boil all the liquors, mixed and ſtrained, down to a proper conſiſtence.

EXTRACTUM OPII. *Dub.*

Extract of Opium.

Take of

Purified opium, two ounces;
Boiling water, one pound.

Melt the opium in the water, and to the liquor ſtrained, while it is warm add one pound of cold diſtilled water. Expoſe this liquor for two days to the air, filter it again, and, laſtly, evaporate it to the conſiſtence of an extract over a very gentle fire.

EXTRACTUM SENNÆ. *Lond.*

Extract of Senna.

Take of

Senna, one pound;
Diſtilled water, one gallon.

Boil the ſenna in the diſtilled water, adding after its decoction a little rectified ſpirit of wine. Evaporate the ſtrained liquor to a proper thickneſs.

Dub.

Take of
Senna, one pound;
Water, eight pounds;
Rectified ſpirit of wine, eight ounces.

Boil the ſenna, in the water to one half; add the ſpirit to the decoction after it is cold, and digeſt in a covered veſſel for twenty-four hours, then expreſs the liquor, and evaporate it to a proper thickneſs over a very gentle fire.

EXTRACTS made with ALCOHOL and WATER.

EXTRACTUM CINCHONÆ OFFICINALIS. *Ed.*

Extract of Cinchona.

Take of
Cinchona bark, in powder, one pound;
Alcohol, four pounds.

Digeſt for four days, and pour off the tincture.

Boil the reſiduum in five pounds of diſtilled water for fifteen minutes, and filter the decoction boiling hot through linen. Repeat this decoction and filtration with an equal quantity of diſtilled water, and reduce the liquor by evaporation to the conſiſtence of thin honey. Draw off the alcohol from the tincture by diſtillation, until it alſo become thick; then mix the liquors, thus inſpiſſated, and evaporate them in a bath of boiling water, ſaturated with muriate of ſoda, to a proper conſiſtency.

EXTRACTUM RADICIS CONVOLVULI JALAPÆ. *Ed.*

Extract of Jalap.

This is prepared in the ſame way.

EXTRACTUM CORTICIS PERUVIANI CUM RESINA. *Lond.*

Extract of Peruvian Bark with the Reſin.

Take of
Peruvian bark, reduced to coarſe powder, one pound;
Rectified ſpirit of wine, four pints.

Digeſt it for four days, and pour off the tincture; boil the reſiduum in ten pints of diſtilled water to two; then ſtrain the tincture and decoction ſeparately, evaporating the water from the decoction, and diſtilling off the ſpirit from the tincture, until each begins to be thickened. Laſtly, mix the reſinous, with the aqueous, extract, and make the maſs fit for forming into pills.

In the ſame way are prepared

EXTRACTUM CASCARILLÆ. *Lond.*

Extract of Caſcarilla.

EXTRACTUM JALAPII. *Lond.*

Extract of Jalap.

Off. prep.—Pulv. ſcam. comp. *Lond.* Pulv. ſcam. cum aloe, *Lond,*

EXTRACTUM CASCARILLÆ RESINOSUM. *Dub.*

Reſinous Extract of Caſcarilla.

Take of
Caſcarilla, in coarſe powder, one pound;
Rectified ſpirit of wine, four pounds.

Digeſt for four days, then pour off the tincture and ſtrain; boil the reſiduum in twelve pounds of water to two, and purify this liquor in the ſame way as the former. Evaporate the decoction, and diſtil the tincture till both begin to grow thick; and, laſtly, mix them well together.

EXTRACTUM CORTICIS PERUVIANI RUBRI RESINOSUM. *Dub.*

Reſinous Extract of Red Peruvian Bark.

EXTRACTUM VALERIANÆ SYLVESTRIS RESINOSUM. *Dub.*

Reſinous Extract of Wild Valerian.

These are both prepared in the ſame way.

EXTRACTUM COLOCYNTHIDIS COMPOSITUM. *Lond.*

Compound Extract of Coloquintida.

Take of
Pith of coloquintida, cut ſmall, ſix drachms;
Socotorine aloes, powdered, an ounce and a half;
Scammony, powdered, half an ounce;
Smaller cardamom ſeeds, huſked and powdered, one drachm;
Proof ſpirit, one pint.

Digeſt the coloquintida in the ſpirit, with a gentle heat, during four days. To the expreſſed tincture add the aloes and ſcammony; when theſe are diſſolved, draw off the ſpirit by diſtillation, and evaporate the water, adding the ſeeds towards the end of the proceſs, ſo as to form an extract fit for making into pills.

OPIUM PURIFICATUM. *Lond. Dub.*

Purified Opium.

Take of

Opium, cut into ſmall pieces, one pound;

Proof ſpirit of wine, twelve pints.

Digeſt the opium with a gentle heat, ſtirring now and then till it be diſſolved, and filter through paper. Diſtil the tincture, ſo prepared, to a proper thickneſs, (for making into pills, *Dub.*)

(Purified opium muſt be kept in two forms: one *ſoft*, proper for forming into pills; the other *hard*, which may be reduced into powder, *Lond.*)

Off. prep.—Extract. opii, *Dub.* Pil cret. cum opio, *Lond.* Pulv. ipec. et opii, *Lond. Dub.* Pulv. opiat, *Lond.*

The chapter on extracts and reſins in the London Pharmacopœia is concluded with the two following general directions:

1. All the extracts, during the time of inſpiſſation, muſt be gently agitated.

2. On all the ſofter watery extracts, a ſmall quantity of ſpirit of wine muſt be ſprinkled.

All theſe extracts are ſuppoſed to contain the virtues of the ſubſtances from which they are prepared, in a very pure and concentrated form: but this ſuppoſition is, probably in ſeveral inſtances, erroneous; and the directions for preparing them are frequently injudicious and uneconomical.

As the changes which opium and aloes undergo by ſolution, and ſubſequent evaporation, have never been aſcertained by careful and ſatisfactory experiments, well ſelected pieces of theſe ſubſtances are to be preferred to the preparations in which they are ſuppoſed to be purified.

Cinchona bark is a medicine of very great importance; but unfortunately the proportion of woody fibres, or inert matter, which enter into its compoſition is ſo great, that weak ſtomachs cannot bear it, when given in quantity ſufficient to produce any very powerful effects. On this account, the preparation of an extract, which may contain its active principles in a concentrated form, becomes alſo an object of importance. On this ſubject there is ſtill much room for experiment. The London and Dublin colleges, in their directions, certainly err in two important particulars; in the firſt place, in deſiring the decoction to be continued until the greateſt part of the menſtruum is evaporated; and, in the ſecond place, in ſeparating by filtration the powder which ſeparates from the decoction after it has cooled. The firſt error probably originated in the idea, that by continuing the boiling for a great length of time more of the bark would be diſſolved; but it is now known, that water is incapable of diſſolving more than a certain quantity of the active principles of bark: and that after the water has become ſaturated, by continuing the decoction we diminiſh the quantity of the menſtruum, and therefore alſo diminiſh the quantity of bark diſſolved. It is not eaſy to account for the ſecond error; for, according to the old idea, that the powder which ſeparated on cooling from a ſaturated decoction of cinchona, was a reſinous ſubſtance, it ſurely ought not to have been rejected from what were ſuppoſed to be reſinous extracts. This precipitate is now known to be cauſed by the much greater ſolubility of its active principles in boiling, than in cold, water, ſo that the precipitate is not different ftom what remains in ſolution. Accordingly I have found by experiment, that cinchona gave at leaſt one half more extract when the decoction were conducted according to the directions of the Edinburgh college.

The real advantage of ſo expenſive an agent as alcohol, in preparing any of theſe extracts, has not been demonſtrated; and, if I be not miſinformed, it is ſeldom employed by the apothecaries in preparing even what are called the Reſinous Extracts.

RESINA FLAVA. *Lond. Dub.*

Yellow Roſin.

This remains in the retort after the diſtillation of oil of turpentine.

Turpentines are combinations of volatile oil and reſins, which are eaſily ſeparated by diſtillation. The proceſs, however, cannot be carried ſo far as to ſeparate the whole of the oil, without charring and burning the reſin. In this ſtate it has a brown colour and a certain degree of tranſparency; and is well known under the name of Fidlers Roſin. But, if water be added to the reſiduum of the diſtillation, and be thoroughly mixed with it by agitation, it becomes opaque, and is called Yellow Roſin.

Yellow roſin is a uſeful ingredient in the compoſition of plaſters and hard ointments.

AMMONIACI PURIFICATIO. *Lond.*

The Purification of Gum Ammoniacum.

If gum ammoniac do not ſeem to be pure, boil it in water till it become ſoft; then ſqueeze it through a canvas bag, by means of a preſs. Let it remain at reſt till the reſinous part ſubſide; then evaporate the water; and towards the end of the evaporation, mix the reſinous part with the gummy.

In the ſame manner are purified *aſſa fœtida* and ſimilar *gum reſins.* You may alſo purify any gum which melts eaſy, ſuch as *Galba-*

num, by putting it in an ox-bladder, and holding it in boiling water till it become ſo ſoft that it can be ſeparated from its impurities by preſſing it through a coarſe linen cloth.

As one, and perhaps the moſt active conſtituent of gummy reſins, as they are called, is of a volatile nature, it is evident that it muſt be in a great meaſure diſſipated in the proceſs juſt deſcribed, and that we cannot expect the ſame virtues in theſe ſubſtances after they are purified, which they poſſeſs in their crude ſtate. This proceſs is therefore contrary to the principles of good pharmacy; and ſuch ſpecimens of theſe gummy reſins as ſtand in need of it to give them an apparent degree of purity, ſhould not be admitted into the ſhop of the apothecary. Beſides, many of the impurities which they uſually contain, are eaſily ſeparated in compounding the preparations or extemporaneous preſcriptions into which they enter.

STYRAX PURIFICATA. *Lond. Dub.*

Purified Storax.

Diſſolve the ſtorax in rectified ſpirit of wine, and ſtrain the ſolution; afterwards reduce it to a proper thickneſs with a gentle heat.

Storax is a balſam or combination of reſin and benzoic acid, both of which are ſoluble in alcohol, and neither of them volatile in the heat neceſſary for evaporating alcohol. The proceſs for purifying it is therefore not liable to any chemical objections.

CHAP. XXXV.

POWDERS.

This form is proper for ſuch materials only as as are capable of being ſufficiently dried to became pulveriſable, without the loſs of their virtue. There are ſeveral ſubſtances, however, of this kind, which cannot be conveniently taken in powder; bitter, acrid, fetid, drugs are too diſagreeable; emollient and mucilaginous herbs and roots are too bulky; pure gums cohere, and become tenacious in the mouth: fixed alkaline ſalts deliqueſce when expoſed to the air; and volatile alkalies exhale. Many of the aromatics, too, ſuffer a great loſs of their odorous principles when kept in powder; as in that form they expoſe a much larger ſurface to the air.

The doſe of powders, in extemporaneous preſcription, is generally about half a drachm: it rarely exceeds a whole drachm; and is not often leſs than a ſcruple. Subſtances which produce powerful effects in ſmaller doſes are not truſted to this form, unleſs their bulk be increaſed by additions of leſs efficacy; thoſe which require to be given in larger ones are better fitted for other forms.

The uſual vehicle for taking the lighter powders, is any agreeable thin liquid. The ponderous powders, particularly thoſe prepared from metallic ſubſtances, require a more conſiſtent vehicle, as ſyrups; for from thin ones they ſoon ſubſide: Reſinous ſubſtances likewiſe are moſt commodiouſly taken in thick liquors; for in thin ones, they are apt to run into lumps, which are not eaſily again ſoluble.

PULVIS ALOES cum CANELLA. *Lond.*

Powder of Aloes with Canella.

Take of

Socotorine aloes, one pound;
White canella, three ounces.

Powder them ſeparately, and then mix them.

This compoſition has long been known in the ſhops under the title of *Hiera picra*. It furniſhes us with an uſeful aloetic purgative, the canella operating as a good corrigent for the aloes. But it is more frequently employed as the baſis of electuaries, or pills.

PULVIS ALOETICUS cum GUAIACO. *Lond.*

Aloetic Powder with Guaiacum.

Take of

Socotorine aloes, one ounce and an half;
Gum guaiacum, one ounce;
Aromatic powder, half an ounce.

Rub the aloes and gum guaiacum ſeparately to powder; then mix them with the aromatic powder.

This alſo furniſhes us with a uſeful purgative: but when taken only in ſmall doſes, its chief effect is that of promoting perſpiration.

PULVIS ALOETICUS cum FERRO. *Lond.*

Aloetic Powder with Iron.

Take of

Socotorine aloes, an ounce and an half;
Myrrh, two ounces;
Dry extract of gentian,

Vitriolated iron, of each one ounce.
Reduce them ſeparately to powder, and mix them.

In this powder we have an aloetic and chalybeate conjoined. It is an uſeful medicine, and is particularly employed with advantage in caſes of obſtructed menſtruation.

PULVIS AROMATICUS. *Lond. Dub.*

Aromatic Powder.

Take of
Cinnamon, two ounces;
Smaller cardamom ſeeds, huſked;
Ginger,
Long pepper, of each one ounce.
Rub them together to a powder, (which is to be kept in a well corked phial, *Dub.*)

Edin.

Take of
Cinnamon,
Smaller cardamom ſeeds,
Ginger, each equal parts.
Reduce them to a very fine powder, which is to be kept in a glaſs veſſel well cloſed.

Both of theſe compoſitions are agreeable, hot, ſpicy, medicines; and as ſuch may be uſefully taken in cold phlegmatic habits and decayed conſtitutions, for warming the ſtomach, promoting digeſtion, and ſtrengthening the tone of the viſcera. The doſe is from ten grains to a ſcruple and upwards. The firſt is conſiderably the warmeſt, from the quantity of long pepper which it contains.

Off. prep.—Pulvis aloet cum guaiac, *Lond.* Elect. aromat. *Ed.* Elect. opiat. *Ed.*

PULVIS ASARI COMPOSITUS. *Lond. Dub.*

Compound Powder of Aſarabacca.

Take of
Aſarabacca,
Sweet marjoram,
Syrian herb-maſtich,
Lavender, of each, dried, one ounce.
Reduce them together to powder, which is to be kept in a cloſed phial.

Pulvis Asari Europæi Compositus. *Ed.*

Compound Powder of Aſarabacca.

Take of
The leaves of aſarabacca, three parts.
——— marjoram,

Flowers of lavender, of each one part.
Rub them together to powder.

They are both agreeable and efficacious errhines, and ſuperior to moſt of thoſe uſually ſold under the name of *herb ſnuff*. They are often employed with great advantage in caſes of obſtinate headach, and of ophthalmias reſiſting other modes of cure. Taken under the form of ſnuff to the extent of five or ſix grains at bedtime, they will operate the ſucceeding day as a powerful errhine, inducing frequent ſneezing, and likewiſe a copious diſcharge from the noſe. It is, however, neceſſary, during their operation, to avoid expoſure to cold.

PULVIS CARBONATIS CALCIS COMPOSITUS; olim, Pulvis Cretaceus. *Edin.*

Compound Powder of Carbonate of Lime, formerly *Chalk Powder.*

Take of
Prepared carbonate of lime, four ounces;
Nutmeg, half a drachm;
Cinnamon, one drachm and a half.
Reduce them together to powder.

Pulvis Cretæ Compositus. *Lond.*

Compound Powder of Chalk.

Take of
Prepared chalk, half a pound;
Cinnamon, four ounces;
Tormentil,
Gum arabic, of each three ounces;
Long pepper, half an ounce.
Powder them ſeparately, and mix them.

The addition of the aromatics in the above formula, coincides with the general intention of the remedy, which is indicated in weakneſs and acidity in the ſtomach, and in looſeneſs from acidity.

PULVIS CRETÆ COMPOSITUS cum OPIO. *Lond.*

Compound Powder of Chalk with Opium.

Take of
Compound powder of chalk, eight ounces;
Hard opium, powdered, one drachm and a half.
Mix them.

From the addition of the opium this remedy becomes ſtill more powerful than the preceding in reſtraining diarrhœa.

PULVIS CHELARUM CANCRI COMPOSITUS. *Lond.*

Compound Powder of Crabs Claws.

Take of
  Crabs claws, prepared, one pound;
  Chalk,
  Red coral, each, prepared, three ounces.
Mix them.

The invention of this formula muſt be aſcribed ſolely to the unphiloſophical idea, that the ſum of the powers of medicines was increaſed by mixing them together; for the preſent powder is a mixture of three varieties of carbonate of lime, which, notwithſtanding the immenſe differences of their prices, do not differ in their effects.

Off. prep.—Pulv. contrayerv. comp. *Lond.* Confectio aromat. *Lond.*

PULVIS CERUSSÆ COMPOSITUS. *Lond.*

Compound Powder of Ceruſe.

Take of
  Ceruſe, five ounces;
  Sarcocoll, an ounce and a half;
  Tragacanth, half an ounce.
Powder them together.

This is employed for external purpoſes, as in collyria, lotions, and injections for repelling acrimonious humours, and in inflammations; but for all theſe purpoſes it is very inferior to ſolutions of acetate of lead.

PULVIS CONTRAYERVÆ COMPOSITUS. *Lond.*

Compound Powder of Contrayerva.

Take of
  Contrayerva, powdered, five ounces;
  Compound powder of crabs claws, one pound and a half.
Mix them.

This medicine has a very good claim to the title of an alexipharmic and ſudorific. The contrayerva by itſelf proves very ſerviceable in low fevers, where the vis vitæ is weak, and a diaphoreſis to be promoted. It is poſſible, that the crabs claws are of no farther ſervice than as they divide this active ingredient, and make it ſit more eaſily on the ſtomach.

PULVIS IPECACUANHÆ ET OPII. *Edin.* PULVIS IPECACUANHÆ COMPOSITUS; olim PULVIS DOVERI. *Lond. Dub.* *Powder of Ipecacuan and Opium*, or *Compound Powder of Ipecacuan*, formerly *Dover's Powder.*

Take of
Ipecacuan in powder,
Opium, (purified, *Dub.* hard purified, *Lond.*) of each one part;
Sulphate of potaſs, eight parts.
Triturate them together into a fine powder.

THE ſulphate of potaſs, from the grittineſs of its cryſtals, is perhaps better fitted for tearing and dividing the tenacious opium than any other ſalt: this ſeems to be its only uſe in the preparation. The operator ought to be careful that the opium and ipecacuanha be equally diffuſed through the whole maſs of powder, otherwiſe different portions of the powder muſt have differences in degree of ſtrength.

This powder is one of the moſt certain ſudorifics, and, as ſuch was recommended by Dr. Dover as an effectual remedy in rheumatiſm. Modern practice confirms its reputation, not only in rheumatiſm, but alſo in dropſy and ſeveral other diſeaſes, where it is often difficult by other means to produce a copious ſweat. The doſe is from five to twenty grains, according as the patient's ſtomach and ſtrength can bear it. It is proper to avoid much drinking immediately after taking it, otherwiſe it is very apt to be rejected by vomiting before any other effects are produced.

PULVIS JALAPÆ COMPOSITUS. *Edin.*
Compound Powder of Jalap.

Take of
Jalap root, one part;
Super-tartrite of potaſs, two parts.
Grind them together to a very fine powder.

THE uſe of the cryſtals in this preparation, is to break down and divide the jalap; and therefore they are directed to be triturated together, and not ſeparately.

PULVIS MYRRHÆ COMPOSITUS. *Lond.*
Compound Powder of Myrrh.

Take of
Myrrh,
Dried ſavin,
—— rue,
Ruſſian caſtor, of each one ounce,
Rub them together into a powder.

This is a reformation of the Trochiſci è Myrrha, a compoſition contrived by Rhazes againſt uterine obſtructions. From a ſcruple to a drachm or more, two or three times a-day, may be taken in any convenient vehicle, or made into boluſes.

PULVIS OPIATUS. *Lond.*

Opiate Powder.

Take of
Hard purified opium, powdered, one drachm;
Burnt and prepared hartſhorn, nine drachms.
Mix them.

Edin.

Take of
Opium, one part;
Prepared carbonate of lime, nine parts.
Rub them together to a fine powder.

In theſe powders the opium is the active ingredient; and it is immaterial whether the phoſphate or carbonate of lime be uſed to promote its mechanical diviſion.

PULVIS SCAMMONII COMPOSITUS. *Lond.*

Compound Powder of Scammony.

Take of
Scammony,
Hard extract of jalap, of each two ounces;
Ginger, half an ounce.
Powder them ſeparately, and mix them.

Edin.

Take of
Scammony,
Super-tartrite of potaſs, equal parts.
Rub them together to a very fine powder.

Dub.

Take of
Scammony,
Vitriolated vegetable alkali, each two ounces;
Ginger, half an ounce.
Powder them ſeparately and then mix them.

In the firſt of theſe compoſitions, the ſcammony is combined with another purgative more active than itſelf, and in the others, with one much leſs ſo; which difference muſt be attended to in preſcription. The ginger is an uſeful addition, and will render it leſs apt to gripe.

PULVIS SCAMMONII COMPOSITUS cum ALOE. *Lond.*

Compound Powder of Scammony with Aloes.

Take of
  Scammony, ſix drachms;
  Hard extract of jalap,
  Socotorine aloes, of each an ounce and a half;
  Ginger, half an ounce.
Powder them ſeparately, and mix them.

In this formula, the combination of ſcammony, jalap, and aloes, furniſhes a very active purgative, which, with ſome intentions at leaſt, may be preferable to either of the preceding. From five to ten grains of it operates as a purgative, even in caſes of obſtinate coſtiveneſs.

PULVIS SCAMMONII cum CALOMELANE. *Lond.*

Powder of Scammony with Calomel.

Take of
  Scammony, half an ounce;
  Calomel,
  Double refined ſugar, of each two drachms.
Powder them ſeparately, and then mix them.

In this formula, we have the ſcammony in a more ſimple ſtate, united with ſuch a proportion of calomel, as muſt very conſiderably aid its purgative power; and accordingly it may be employed with advantage, both in caſes of obſtinate coſtiveneſs, and in dropſical affections, where a conſiderable diſcharge is required from the ſyſtem.

PULVIS SENNÆ COMPOSITUS. *Lond.*

Compound Powder of Senna.

Take of,
  Senna,
  Cryſtals of tartar, of each two ounces;
  Scammony, half an ounce;
  Ginger, two drachms.
Triturate the ſcammony by itſelf, reduce the reſt together into a powder, and then mix them all.

This powder is given as a cathartic, in the doſe of two ſcruples, or a drachm. The ſpice is added, not only to divide, but to warm the medicine, and make it ſit eaſier on the ſtomach. The ſcammony is uſed as a ſtimulus to the ſenna; the quantity of the latter neceſſary for a doſe, when not aſſiſted by ſome more powerful material, being too bulky to be conveniently taken in this form.

PULVIS SULPHATIS ALUMINÆ COMPOSITUS; olim, PULVIS STYPTICUS. *Ed.*

Compound Powder of Sulphate of Alumina, formerly *Styptic Powder.*

Take of
  Sulphate of alumina, four parts;
  Kino, one part.
Rub them together to a fine powder.

THIS powder is compoſed of two very powerful aſtringents, but which we believe are not combined with propriety. At leaſt, it is certain that a ſolution of alum is decompoſed by a ſolution of kino.

PULVIS TRAGACANTHÆ COMPOSITUS. *Lond.*

Compound Powder of Tragacanth.

Take of
  Tragacanth, powdered,
  Gum arabic,
  Starch, of each an ounce and a half;
  Double refined ſugar, three ounces.
Rub them together into a powder.

THIS compoſition is a mild emollient; and hence becomes ſerviceable in hectic caſes, tickling coughs, ſtrangury, ſome kinds of alvine fluxes, and other diſorders proceeding from a thin acrimonious ſtate of the humours, or an abraſion of the mucus of the inteſtines: they ſoften, and give a greater degree of conſiſtency to the former, and defend the latter from being irritated or excoriated by them. All the ingredients coincide in theſe general intentions. The doſe is from half a drachm to two or three drachms, which may be frequently repeated.

CHAP. XXXVI.

CONSERVES.

CONSERVES are compoſitions of recent vegetable matters and ſugar, beaten together into an uniform maſs.

This management is introduced for preſerving certain ſimples, undried, in an agreeable form, with as little alteration as poſſible in their native virtues; and in ſome caſes it is very advantageous. Vegetables, whoſe virtues are loſt or deſtroyed in drying, may in this form be kept uninjured for a conſiderable time: for, by carefully ſecuring the mouth of the containing veſſel, the alteration, as well as diſſipation, of their active principles, is generally prevented; and the ſugar preſerves them from the corruption which juicy vegetables would otherwiſe undergo.

The ſugar ſhould be pounded by itſelf, and paſſed through a ſieve, before it be mixed with the vegetable maſs, for without this it cannot be properly incorporated. Roſe buds, and ſome other vegetables, are prepared for mixing with ſugar by a ſmall wooden mill contrived for that purpoſe.

There are, however, vegetables whoſe virtues are impaired by this treatment. Mucilaginous ſubſtances, by long lying with ſugar, become leſs glutinous; and aſtringents ſenſibly become ſofter upon the palate. Many of the fragrant flowers are of ſo tender and delicate a texture, as almoſt entirely to loſe their peculiar qualities on being beaten or bruiſed.

In general, it is obvious, that in this form, on account of the large admixture of ſugar, only ſubſtances of conſiderable activity can be taken with advantage as medicines. And, indeed, conſerves are at preſent conſidered chiefly as auxiliaries to medicines of greater efficacy, or as intermediums for joining them together. They are very convenient for reducing into boluſes or pills the more ponderous powders, as ſub-muriate of mercury, the oxides of iron, and other mineral preparations; which, with liquid or leſs conſiſtent matters, as ſyrups, will not cohere.

The ſhops were formerly encumbered with many conſerves altogether inſignificant; the few now retained have in general either an agreeable flavour to recommend them, or are capable of anſwering ſome uſeful purpoſes as medicines. Their common doſe is the bulk of a nutmeg, or as much as can be taken up at once or twice upon the point of a knife. There is, in general, no great danger of exceeding in this particular.

CONSERVÆ.

Citri aurantii, *Ed.* Aurantii Hiſpalenſis, *Lond.* Corticis aurantii, *Dub.*

Conſerve of orange-peel.

Off. prep.—Elect. aromat. *Dub.*

Roſæ caninæ, *Ed.* Cynoſbati, *Lond.*

Conſerve of hips.

Roſæ rubræ, *Ed. Lond.* Roſæ, *Dub.*
Conſerve of red roſe buds.
Off. prep.—Pil hydrarg. *Ed. Lond.*
Abſinthii maritimæ, *Lond.*
Conſerve of ſea wormwood.
Lujulæ, *Lond.* Acetoſellæ, *Dub.*
Conſerve of wood ſorrel.

Pluck the leaves from the ſtalks, the unblown petals from the cups, taking off the heels. Take off the outer rind of the oranges by a grater.

When prepared in this way, beat them with a wooden peſtle in a marble mortar, firſt by themſelves, afterwards with three times their weight of double refined ſugar, until they be mixed.

The only exceptions to theſe general directions, which are thoſe of the London college, are, that the London college adds only twenty ounces of ſugar to one pound of the pulp of hips, and that the Dublin add only twice their weight of ſugar to the ſorrel leaves. La Grange ſays, that by infuſing the red roſe leaves in four times their weight of water, which is afterwards to be expreſſed from them, they loſe their bitterneſs, and are more eaſily reduced to a pulp, which he then mixes with a thick ſyrup, prepared by diſſolving the ſugar in the expreſſed liquor, and boiling it down to the conſiſtence of an electuary.

It is ſcarcely neceſſary to make any particular remarks on theſe conſerves. Their taſte and virtues are compounded of thoſe of ſugar, and the ſubſtance combined with it. The wood ſorrel and hips are acidulous and refrigerant; the orange-rind and wormwood bitter and ſtomachic, and the red-roſe buds aſtringent.

CONSERVA ARI. *Lond.*

Conſerve of Arum.

Take of
Freſh root of arum, bruiſed, half a pound;
Double refined ſugar, a pound and a half.
Beat them together in a mortar.

This is one of the beſt forms for exhibiting this ſimple, as its virtues are deſtroyed by drying, and are not extracted by any menſtruum. It may be given to adults in doſes of a drachm.

CONSERVA PRUNI SYLVESTRIS. *Lond.*

Conſerve of Sloes.

Put the ſloes in water upon the fire that they may ſoften, taking care that they be not broken; then take them out of the water, preſs out the pulp, and mix it with three times its weight of double refined ſugar into a conſerve.

This preparation is a gentle aſtringent, and may be given as ſuch in the doſe of two or three drachms.

CONSERVA SCILLÆ. *Lond.*

Conſerve of Squills.

Take of

Freſh ſquills, one ounce;

Double refined ſugar, five ounces.

Beat them together in a mortar into a conſerve.

This conſerve is directed to be prepared in a ſmall quantity, to guard againſt its varying in ſtrength. It may be given, to adults, in doſes of from half a drachm to two ſcruples, eſpecially when freſh.

The conſerve of ſquills is a more uncertain and leſs agreeable mode of exhibiting this article than the powder of the dried root made into pills, or a bolus, with any other conſerve.

The London college conclude their chapter on conſerves with deſiring all the conſerves, eſpecially thoſe of arum and ſquills, to be kept in cloſe veſſels.

CHAP. XXXVII.

ELECTUARIES and CONFECTIONS.

Electuaries are compoſed chiefly of powders mixed up with ſyrups, &c. into ſuch a conſiſtence, that the powders may not ſeparate in keeping, that a doſe may be eaſily taken up on the point of a knife, and not prove too ſtiff to ſwallow.

Electuaries receive chiefly the milder alterative medicines, and ſuch as are not ungrateful to the palate. The more powerful drugs, as cathartics, emetics, opiates, and the like, (except in officinal electuaries to be diſpenſed by weight), are ſeldom truſted in this form, on account of the uncertainty of the doſe: diſguſtful ones, acrids, bitters, fetids, cannot be conveniently taken in it; nor is the form of an electuary well fitted for the more ponderous ſubſtances, as mercurials, theſe being apt to ſubſide on keeping, unleſs the compoſition be made very ſtiff.

The lighter powders require thrice their weight of honey, or ſyrup boiled to the thickneſs of honey, to make them into the conſiſtence of an electuary: of ſyrups of the common conſiſtence, twice the weight of the powder is ſufficient.

Where the common ſyrups are employed, it is neceſſary to add likewiſe a little conſerve, to prevent the compound from candying and drying too ſoon. Electuaries of Peruvian bark, for inſtance, made up with ſyrup alone, will often in a day or two grow too dry for taking.

This is owing to the cryſtallization of the ſugar. Deyeux, therefore, adviſes electuaries, confections, and conſerves, to be made up with ſyrups from which all the cryſtallizable parts have been ſeparated. For this purpoſe, after being ſufficiently evaporated, they are to be expoſed to the heat of a ſtove as long as they form any cryſtals. The ſyrup which remains, probably from the preſence of ſome vegetable acid, has no tendency to cryſtallize, and is to be decanted and evaporated to a proper conſiſtence. In hoſpital practice, the ſame object may be obtained much more eaſily by uſing molaſſes inſtead of ſyrups.

The quantity of an electuary, directed at a time, in extemporaneous preſcription, varies much according to its conſtituent parts, but is rarely leſs than the ſize of a nutmeg, or more than two or three ounces.

ELECTUARIUM AROMATICUM. *Edin.*

Aromatic Electuary.

Take of
  Aromatic powder, one part;
  Syrup of orange-peel, two parts.
Mix and beat them well together, ſo as to form an electuary.

Dub.

Take of
  Conſerve of orange-peel, three ounces;
  Cinnamon,
  Nutmeg, of each, in powder, half an ounce;
  Ginger, in powder,
  Saffron, of each two drachms;
  Double refined ſugar, one ounce;
  Syrup of orange peel, as much as may be neceſſary to form the whole into an electuary, by beating them well together.

CONFECTIO AROMATICA. *Lond.*
Aromatic Confection.

Take of
Zedoary, in coarſe powder,
Saffron, of each half a pound;
Diſtilled water, three pints.

Macerate for twenty-four hours; then preſs and ſtrain. Reduce the ſtrained liquor, by evaporation, to a pint and a half; to which add,
Compound powder of crabs claws, ſixteen ounces;
Cinnamon,
Nutmeg, of each two ounces;
Cloves, one ounce;
Smaller cardamom ſeeds, half an ounce;
Double refined ſugar, two pounds.

Reduce the aromatics together to a very fine powder, and form them into a confection, by adding the ſugar.

These compoſitions are ſufficiently grateful, and moderately warm. They are given in the form of a bolus, in doſes of from five grains to a ſcruple, or upwards, as a cordial, or as a vehicle for more active ſubſtances. The ſimple compoſition of the Edinburgh college ſerves all theſe purpoſes as well as the complicated formula of the London college.

ELECTUARIUM CASSIÆ FISTULÆ. *Edin.*
Electuary of Caſſia.

Take of
Pulp of caſſia fiſtularis, ſix ounces;
Pulp of tamarinds,
Manna, each an ounce and a half;
Syrup of pale roſes, ſix ounces.

Having beat the manna in a mortar, diſſolve it with a gentle heat, in the ſyrup; then add the pulps, and evaporate them with a regularly continued heat to the conſiſtence of an electuary.

ELECTUARIUM CASSIÆ. *Lond. Dub.*
Elceuary of Caſſia.

Take of
The freſh extracted pulp of caſſia, half a pound;
Manna, two ounces;
Pulp of tamarinds, one ounce;
Roſe ſyrup, half a pound.

Boil the manna, and diſſolve it over a ſlow fire in the roſe ſyrup;

then add the pulps; and, with a continued heat, evaporate the whole to the proper thickneſs of an electuary.

THESE compoſitions are very convenient officinals, to ſerve as a baſis for purgative electuaries and other ſimilar purpoſes. The tamarinds give them a pleaſant taſte, and do not ſubject them, as might be expected, to turn ſour. After ſtanding for four months, the compoſition has been found no ſourer than when firſt made. This electuary, likewiſe, is uſefully taken by itſelf, to the quantity of two or three drachms occaſionally, for gently looſening the belly in coſtive habits.

ELECTUARIUM CASSIÆ SENNÆ; olim, ELECTUARIUM LENITIVUM. *Edin.* ELECTUARIUM SENNÆ. *Lond.*
Electuary of Senna, commonly called *Lenitive Electuary.*

Take of
Senna, eight ounces;
Coriander ſeeds, four ounces;
Liquorice, three ounces;
Figs, one pound;
Pulp of Tamarinds,
——— caſſia,
——— prunes, each half a pound;
Double refined ſugar, two pounds and a half.

Powder the ſenna with the coriander ſeeds, and ſift out ten ounces of the mixed powder. Boil the remainder with the figs and liquorice, in four pints of (diſtilled, *Lond.*) water, to one half; then preſs out and ſtrain the liquor. Evaporate this ſtrained liquor to the weight of about a pound and a half; then add the ſugar, and make a ſyrup; add this ſyrup by degrees to the pulps, and, laſtly, mix in the powder.

Dub.

Take of
Senna leaves, in very fine powder, four ounces;
Pulp of French prunes, one pound;
——— tamarinds, two ounces;
Molaſſes, a pound and a half;
Eſſential oil of caraway, two drachms.

Boil the pulps in the ſyrup to the thickneſs of honey; then add the powders, and, when the mixture is cooled, add the oil; then beat them all well together, ſo as to form an electuary.

THIS electuary is a very convenient laxative, and has long been in common uſe among practitioners. Taken to the ſize of a nutmeg or more, as occaſion may require, it is an excellent laxative for looſening the belly in coſtive habits. The formula of the Dublin college is much more ſimple and elegant than the other.

ELECTUARIUM CATECHU; olim, CONFECTIO JAPONICA. *Edin.*

Electuary of Catechu, commonly called *Japonic Confection.*

Take of
Extract of mimoſa catechu, four ounces;
Kino, three ounces;
Cinnamon,
Nutmeg, each one ounce;
Opium, diffuſed in a ſufficient quantity of Spaniſh white wine, one drachm and a half;
Syrup of red roſes, boiled to the conſiſtence of honey, two pounds and a quarter.

Reduce the ſolids to powder; and having mixed them with the opium and ſyrup, make them into an electuary.

ELECTUARIUM CATECHU COMPOSITUM; olim, CONFECTIO JAPONICA. *Dub.*

Compound Electuary of Catechu, formerly *Japonic Confection.*

Take of
Catechu, four ounces;
Cinnamon,
Nutmeg, each one ounce;
Kino, three ounces;
Purified opium, diffuſed in a ſufficient quantity of Spaniſh white wine, a drachm and a half;
Syrup of ginger,
Syrup of orange-peel, of each, evaporated to the conſiſtence of honey, fourteen ounces;
Tincture of Tolu, two drachms.

Mix them, ſo as to form an electuary.

THESE electuaries, which do not differ in any material particular, are extremely uſeful aſtringent medicines, and are often given in doſes of a tea ſpoonful, frequently repeated, in caſes of diarrhœa, &c. Ten ſcruples contain one grain of opium.

ELECTUARIUM SCAMMONII. *Lond. Dub.*

Electuary of Scammony.

Take of
Scammony, in powder, one ounce and a half;

Cloves,
Ginger, of each ſix drachms;
Eſſential oil of caraway, half a drachm;
(Syrup of roſes, as much as is ſufficient, *Lond.*) (ſyrup of orange-peel, *Dub.*)

Mix the ſpices, powdered together, with the ſyrup; then add the ſcammony, and laſtly, the oil of caraway.

THIS electuary is a warm briſk purgative. A drachm and a half contain fifteen grains of ſcammony.

ELECTUARIUM OPIATUM; olim, ELECTUARIUM THEBAICUM. *Edin.*

Opiate Electuary, commonly called *Thebaic Electuary.*

Take of
Aromatic powder, ſix ounces;
Virginian ſnake root, in fine powder, three ounces;
Opium diffuſed in a ſufficient quantity of Spaniſh white wine, half an ounce;
Syrup of ginger, one pound.

Mix them, and form an electuary.

CONFECTIO OPIATA. *Lond.*

Confection of Opium.

Take of
Hard purified opium, powdered, ſix drachms;
Long pepper,
Ginger,
Caraway ſeeds, of each two ounces;
Syrup of white poppy, boiled to the conſiſtence of honey, three times the weight of the whole.

Mix the purified opium with the ſyrup heated; then add the other ingredients, rubbed to powder.

THE action which theſe electuaries will produce on the living ſyſtem, is abundantly apparent from the nature of their ingredients. They are combinations of aromatics with opium; one grain of opium being contained in thirty-ſix of the London confection, and in forty-three of the Edinburgh electuary.

CHAP. XXXVIII.

TROCHES.

Troches and lozenges are compoſed of powders made up with glutinous ſubſtances into little cakes, and afterwards dried. This form is principally made uſe of for the more commodious exhibition of certain medicines, by fitting them to diſſolve ſlowly in the mouth, ſo as to paſs by degrees into the ſtomach; and hence theſe preparations have generally a conſiderable proportion of ſugar or other materials grateful to the palate. Some powders have likewiſe been reduced into troches, with a view to their preſervation; though poſſibly for no very good reaſons; for the moiſtening, and afterwards drying them in the air, muſt in this light be of greater injury than any advantage accruing from this form can counterbalance.

TROCHISCI CARBONATIS CALCIS. *Edin.*
Troches of Carbonate of Lime.

Take of
  Carbonate of lime, prepared, four ounces;
  Gum arabic, one ounce;
  Nutmeg, one drachm;
  Double refined ſugar, ſix ounces.
Powder them together, and form them with water into a maſs for making troches.

Trochisci Cretæ. *Lond.*
Troches of Chalk.

Take of
  Chalk, prepared, four ounces;
  Crabs claws, prepared, two ounces;
  Cinnamon, half an ounce;
  Double refined ſugar, three ounces.
Powder them, and make them into troches with mucilage of gum arabic.

These are uſed againſt acidity of the ſtomach, eſpecially when accompanied with diarrhœa.

TROCHISCI GLYCYRRHIZÆ. *Lond. Dub.*

Troches of Liquorice.

Take of
Extract of liquorice,
Double refined ſugar, of each ten (ſix, *Dub.*) ounces;
Tragacanth, powdered, three (two, *Dub.*) ounces.
Powder them thoroughly, and make them into troches with roſe water.

Edin.

Take of
Extract of liquorice,
Gum arabic, each one part;
White ſugar, two parts.
Diſſolve them in warm water, and ſtrain: then evaporate the ſolution over a gentle fire till it be of a proper conſiſtence for being formed into troches.

These are both agreeable pectorals, and may be uſed at pleaſure in tickling coughs. The former of theſe two receipts is the eaſieſt and beſt mode of making theſe troches. Refined extract of liquorice ſhould be uſed; and it is eaſily powdered in the cold, after it has been laid for ſome days in a dry and rather warm place. The ſolution and ſubſequent evaporation directed by the Edinburgh college is exceedingly troubleſome, and apt to give them an empyreumatic flavour.

TROCHISCI GLYCYRRHIZÆ CUM OPIO. *Ed.*

Liquorice Troches with Opium.

Take of
Opium, two drachms;
Tincture of Tolu, half an ounce;
Common ſyrup, eight ounces;
Extract of liquorice, ſoftened in warm water,
Gum arabic, in powder, of each five ounces.
Triturate the opium well with the tincture, then add by degrees the ſyrup and extract; afterwards gradually ſprinkle upon the mixture the powdered gum arabic. Laſtly, dry them ſo as to form a maſs to be made into troches, each weighing ten grains.

TROCHISCI GLYCYRRHIZÆ COMPOSITI. *Dub.*

Compound Troches of Liquorice.

Take of
Purified opium, two drachms;

Balſam of Peru, one drachm;
Tincture of myrrh, three drachms.

Triturate the opium in the balſam and tincture mixed, until it be perfectly diſſolved; then gradually add of

Tincture of Tolu, two drachms;
Extract of liquorice, ſoftened in warm water, nine ounces.

Beat them together thoroughly, gradually adding of

Gum arabic, in powder, five ounces, and form the maſs into troches, weighing ten grains each.

These directions for preparing the above troches are ſo full and particular, that no further explanation is neceſſary. Six of the Dublin troches, and ſeven and a half of the Edinburgh, contain about one grain of opium. Theſe troches are medicines of approved efficacy in tickling coughs depending on an irritation of the fauces. Beſides the mechanical effect of the inviſcating matters in involving acrid humours, or lining and defending the tender membranes, the opium muſt no doubt have a conſiderable ſhare, by more immediately diminiſhing the irritability of the parts themſelves.

TROCHISCI GUMMOSI. *Edin.*

Gum Troches.

Take of

Gum arabic, four parts;
Starch, one part;
Double refined ſugar, twelve parts.

Powder them, and make them into a proper maſs with roſe water, ſo as to form troches.

TROCHISCI AMYLI. *Lond.*

Troches of Starch.

Take of

Starch, one ounce and a half;
Liquorice, ſix drachms;
Florentine orris, half an ounce;
Double refined ſugar, one pound and a half.

Powder them, and by means of mucilage of gum tragacanth, make troches.

They may be made, if ſo choſen, without the orris.

These compoſitions are very agreeable pectorals, and may be uſed at pleaſure. They are calculated for allaying the tickling in the throat which provokes coughing.

Although the compoſition in the London and Edinburgh pharmacopœias be ſomewhat different, yet their effects are very much the ſame.

TROCHISCI MAGNESIÆ. *Lond.*

Troches of Magneſia.

Take of
  Burnt magneſia, four ounces;
  Double refined ſugar, two ounces;
  Ginger, powdered, one ſcruple.
Triturate them together, and, with the addition of the mucilage of gum arabic, make troches.

These are excellent antacids, and at the ſame time tend to keep the bowels open.

TROCHISCI NITRATIS POTASSÆ. *Ed.*

Troches of Nitrate of Potaſs.

Take of
  Nitrate of potaſs, one part;
  Double refined ſugar, three parts.
Rub together to powder and form them with mucilage of gum tragacanth into a maſs, to be divided into troches.

TROCHISCI NITRI. *Lond.*

Troches of Nitre.

Take of
  Purified nitre, powdered, four ounces;
  Double refined ſugar, powdered, one pound;
  Tragacanth, powdered, ſix drachms.
With the addition of water, make troches.

This is a very agreeable form for the exhibition of nitre; though, when the ſalt is thus taken without any liquid, (if the quantity be conſiderable), it is apt to occaſion uneaſineſs about the ſtomach, which can only be prevented by large dilution with aqueous liquors.

TROCHISCI SULPHURIS. *Lond.*

Troches of Sulphur.

Take of
  Waſhed flowers of ſulphur, two ounces;
  Double refined ſugar, four ounces.

Rub them together, with a ſufficient quantity of the mucilage of quince ſeeds, and make troches.

THIS compoſition is to be conſidered only as an agreeable form for the exhibition of ſulphur, no alteration or addition being here made to its virtues.

CHAP. XXXIX.

PILLS.

To this form are peculiarly adapted thoſe drugs which operate in a ſmall doſe, and whoſe nauſeous and offenſive taſte or ſmell require them to be concealed from the palate.

Pills ſhould have the conſiſtence of a firm paſte, a round form, and a weight not exceeding five grains. Eſſential oils may enter them in ſmall quantity: deliqueſcent ſalts are improper. Efflo-reſcent ſalts, ſuch as carbonate of ſoda, ſhould be previouſly expoſed, ſo as to fall to powder: deliqueſcent extracts ſhould have ſome powder combined with them. The maſs ſhould be beaten until it become perfectly uniform and plaſtic. Powders may be made into pills with extracts, balſams, ſoap, mucilages, bread crumb, &c.

Gummy reſins, and inſpiſſated juices, are ſometimes ſoft enough to be made into pills, without addition: where any moiſture is requiſite, ſpirit of wine is more proper than ſyrups or conſerves, as it unites more readily with them, and does not ſenſibly increaſe their bulk. Light dry powders require ſyrup or mucilages: and the more ponderous, as the mercurial and other metallic preparations, thick honey, conſerve, or extracts.

Light powders require about half their weight of ſyrup; or of honey, about three fourths their weight; to reduce them into a due conſiſtence for forming pills. Half a drachm of the maſs will make five or ſix pills of a moderate ſize.

Gums and inſpiſſated juices, are to be firſt ſoftened with the liquid preſcribed: the powders are then to be added, and the whole beat thoroughly together, till they be perfectly mixed.

The maſſes for pills are beſt kept in bladders, which ſhould be moiſtened now and then with ſome of the ſame kind of liquid that the maſs was made up with, or with ſome proper aromatic oil.

When the maſs is to be divided into pills, a given weight of it is rolled out into a cylinder of a given length, and of an equal thickneſs throughout, and is then divided into a given number of equal pieces, by means of a ſimple machine. Theſe pieces are then rounded between the fingers; and, to prevent them from adhering, they are covered either with ſtarch, or powder of liquorice, or orris root. In Germany the powder of lycopodium is much uſed.

PILULÆ ALOETICÆ. *Ed.*

Aloetic Pills.

Take of
  Aloes, in powder,
  Soap, equal parts.
Beat them with ſimple ſyrup into a maſs fit for making pills.

Dub.

Take of
  Barbadoes aloes, in powder, one ounce;
  Extract of gentian, half an ounce;
  Ginger, in powder, two drachms.
Beat them together, and form a maſs with jelly of ſoap, (gelatina ſaponis.)

PILULÆ ALOES COMPOSITÆ. *Lond.*

Compound Pills of Aloes.

Take of
  Socotorine aloes, powdered, one ounce;
  Extract of gentian, half an ounce;
  Oil of caraway ſeeds, two ſcruples;
  Syrup of ginger, as much as is ſufficient.
Beat them together.

Although ſoap can ſcarcely be thought to facilitate the ſolution of the aloes in the ſtomach, as was ſuppoſed by Boerhaave and others, it is probably the moſt convenient ſubſtance that can be added to give it the proper conſiſtence for making pills. When extract of gentian is triturated with aloes, they re-act upon each other, and become too ſoft to form pills, ſo that the addition of any ſyrup to the maſs is perfectly unneceſſary, unleſs at the ſame time ſome powder be added to give it conſiſtency, as is done by the Dublin college. Theſe pills have been much uſed as warm and ſtomachic laxatives: they are very well ſuited for the coſtiveneſs ſo often attendant on people of ſedentary lives. Like other preparations of aloes, they are alſo uſed in jaundice, and in certain caſes of obſtructed menſes. They are ſeldom uſed for producing full purging; but if this be required, a ſcruple or half a drachm of the maſs may be made into pills of a moderate ſize for one doſe.

PILULÆ ALOES, CUM ASSA FŒTIDA. *Ed.*

Pills of Aloes, with Aſſa Fœtida.

Take of
 Socotorine aloes,
 Aſſa fœtida,
 Soap, equal parts.
Form them into a maſs with mucilage of gum arabic.

These pills, in doſes of about ten grains twice a-day, produce the moſt ſalutary effects in caſes of dyſpepſia, attended with flatulence and coſtiveneſs.

PILULÆ ALOES CUM COLOCYNTHIDE. *Ed.*

Pills of Aloes with Colocynth.

Take of
 Socotorine aloes,
 Scammony, of each eight parts;
 Colocynth, four parts;
 Oil of cloves,
 Sulphate of potaſs with ſulphur, of each one part.
Reduce the aloes and ſcammony into a powder with the ſalt; then let the colocynth, beat into a very fine powder, and the oil, be added; laſtly, make it into a proper maſs with mucilage of gum arabic.

In theſe pills we have a very uſeful and active purgative; and where the ſimple aloetic pill is not ſufficient for obviating coſtiveneſs, this will often effectually anſwer the purpoſe. Little of their activity can depend upon the ſalt which enters the compoſition. Theſe pills often produce a copious diſcharge in caſes of obſtinate coſtiveneſs, when taken to the extent only of five or ten grains; but they may be employed in much larger doſes. They are, however, ſeldom uſed with the view of producing proper catharſis. Half a drachm of the maſs contains about five grains of the colocynth, ten of the aloes, and ten of the ſcammony.

PILULÆ ALOES CUM MYRRHA. *Lond.*

Pills of Aloes with Myrrh.

Take of
Socotorine aloes two ounces;
Myrrh,
Saffron, of each one ounce;
Syrup of ſaffron, as much as is ſufficient.
Powder the aloes and myrrh ſeparately; and afterwards beat all the ingredients together into a maſs.

Ed.

Take of
Socotorine aloes, two ounces;
Myrrh, one ounce;
Saffron, half an ounce.
Beat them into a maſs with a proper quantity of ſyrup.

These pills have long continued in practice, without any other alteration than in the ſyrup with which the maſs is made up, and in the proportion of ſaffron. The virtues of this medicine may be eaſily underſtood from its ingredients. Given to the quantity of half a drachm or two ſcruples, they prove conſiderably cathartic, but they anſwer much better purpoſes in ſmaller doſes as laxatives or alteratives.

PILULÆ ASSÆ FŒTIDÆ COMPOSITÆ. *Ed.*

Compound Pills of Aſſa Fœtida.

Take of
Aſſa fœtida,
Galbanum,
Myrrh, each eight parts;
Rectified oil of amber, one part.
Beat them into a maſs with ſimple ſyrup.

PILULÆ GALBANI COMPOSITÆ. *Lond.*

Compound Pills of Galbanum.

Take of
Galbanum,
Opopanax,
Myrrh,
Sagapenum, of each one ounce;
Aſſa fœtida, half an ounce;
Syrup of ſaffron, as much as is ſufficient.
Beat them together.

These pills are deſigned for anti-hyſterics and emmenagogues, and are very well calculated for anſwering thoſe intentions; half a ſcruple, a ſcruple, or more, may be taken every night, or oftener.

PILULÆ AMMONIARETI CUPRI. *Ed.*

Pills of Ammoniaret of Copper.

Take of
  Ammoniaret of copper, ſixteen grains;
  Bread crumb, four ſcruples;
  Water of carbonate of ammonia, as much as may be ſufficient.
Beat them into a maſs, to be divided into thirty-two equal pills.

Each of theſe pills weighs about three grains, and contains ſomewhat more than half a grain of the ammoniaret of copper. They ſeem to be the beſt form of exhibiting this medicine.

PILULÆ HYDRARGYRI. *Ed.*

Mercurial Pills.

Take of
  Purified quickſilver,
  Conſerve of red roſes, of each one ounce;
  Starch, two ounces.
Triturate the quickſilver with the conſerve in a glaſs mortar, till the globules completely diſappear, adding occaſionally a little mucilage of gum arabic; then add the ſtarch, and beat the whole with water into a maſs, which is to be immediately divided into four hundred and eighty equal pills.

Lond.

Take of
  Purified quickſilver, two drachms;
  Conſerve of roſes, three drachms;
  Liquorice, finely powdered, one drachm.
Rub the quickſilver with the conſerve until the globules diſappear; then, adding the liquorice powder, mix them together.

Dub.

Take of
  Quickſilver,
  Extract of liquorice, each three drachms;
  Liquorice root, in fine powder, a drachm and a half.
Triturate the quickſilver with the extract of liquorice, reduced

with warm water to the conſiſtence of honey, until its globules diſappear entirely; then add the powder of liquorice, and as much water as ſhall be ſufficient to form it into a maſs.

The common mercurial pill is one of the beſt preparations of mercury, and may, in general, ſuperſede moſt other forms of this medicine. In its preparation the mercury is minutely divided, and probably converted into the black oxide. To effect its mechanical diviſion it muſt be triturated with ſome viſcid ſubſtance. Soap, reſin of guaiac, honey, extract of liquorice, manna, and conſerve of roſes, have all been at different times recommended. The ſoap and guaiac have been rejected on account of their being decompoſed by the juices of the ſtomach; and the honey, becauſe it was apt to gripe ſome people. With regard to the others, the grounds of ſelection are not well underſtood, perhaps the acid contained in the conſerve of roſes may contribute to the extinction of the mercury. We learn when the mercury is completely extinguiſhed, moſt eaſily, by rubbing a very little of the maſs with the point of the finger on a piece of paper, if no globules appear. As ſoon as this is the caſe, it is neceſſary to mix with the maſs a proportion of ſome dry powder, to give it a proper degree of conſiſtency. For this purpoſe, powder of liquorice root has been commonly uſed; but it is extremely apt to become mouldy, and to cauſe the pills to ſpoil. The Edinburgh college have, therefore, with great propriety, ſubſtituted for it ſtarch, which is a very inalterable ſubſtance, and eaſily procured at all times in a ſtate of purity. It is neceſſary to form the maſs into pills immediately, as it ſoon becomes hard. One grain of mercury is contained in four grains of the Edinburgh maſs, in three of the London, and in two and a half of the Dublin. The doſe of theſe pills muſt be regulated by circumſtances; from two to ſix five-grain pills may be given daily.

PILULÆ OPII. *Lond.*
Pills of Opium.

Take of
Hard purified opium, powdered, two drachms;
Extract of liquorice, one ounce.
Beat them until they are perfectly united.

PILULÆ OPIATÆ; olim, PILULÆ THEBAICÆ. *Ed.*
Opiate, or *Thebaic Pills.*

Take of
Opium, one part;

Extract of liquorice, ſeven parts;
Jamaica pepper, two parts.

Soften the opium, and extract ſeparately with diluted alcohol, and having beat them into a pulp, mix them; then add the pepper reduced to a powder; and, laſtly, having beat them well together, form the whole into a maſs.

These two compoſitions, though differing in ſeveral particulars, are yet fundamentally very much the ſame. The firſt is a ſimple opiate, in which every five grains of the maſs contains one of opium; and on the opium alone can we ſuppoſe that the activity of the medicine depends.

The ſecond contains one grain of opium in ten of the maſs.

PILLULÆ RHEI COMPOSITÆ. *Ed.*
Compound Pills of Rhubarb.

Take of
Rhubarb, one ounce;
Socotorine aloes, ſix drachms;
Myrrh, half an ounce;
Eſſential oil of peppermint, half a drachm.

Make them into a maſs, with a ſufficient quantity of ſyrup of orange peel.

This pill is intended for moderately warming and ſtrengthening the ſtomach, and gently opening the belly. A ſcruple of the maſs may be taken twice a-day.

PILULÆ SCILLÆ. *Lond.* PILULÆ SCILLITICÆ. *Dub.*
Squill Pills.

Take of
Freſh dried ſquills, powdered, one drachm;
Ginger, powdered,
Soap, of each three drachms;
Ammoniacum, two drachms;
Syrup of ginger, as much as is ſufficient.

Beat them together, (and form a maſs with jelly of ſoap, *Dub.*)

PILULÆ SCILLITICÆ. *Edin.*
Squill Pills.

Take of
Dried root of ſquills, in fine powder, one ſcruple;

Gum ammoniac,
Leſſer cardamom ſeeds, in powder,
Extract of liquorice, each one drachm.
Mix, and form them into a maſs with ſimple ſyrup.

These are elegant and commodious forms for the exhibition of ſquills, whether for promoting expectoration, or with the other intentions to which that medicine is applied. As the virtue of the compound is derived chiefly from the ſquills, the other ingredients are often varied in extemporaneous preſcription.

PILULÆ STIBII COMPOSITÆ; olim, PILULÆ PLUMMERI. *Dub.*

Compound Antimonial Pills, formerly *Plummer's Pills.*

Take of
Precipitated ſulphur of antimony,
Mild muriate of mercury, each three drachms;
Extract of gentian,
Hard Spaniſh ſoap, each one drachm.
Let the mercury be triturated with the ſulphur; then add the extract, and form a maſs with jelly of ſoap.

These pills were recommended to the attention of the public about forty years ago by Dr. Plummer, whoſe name they long bore. He repreſented them in a paper which he publiſhed in the Edinburgh medical eſſays as a very uſeful alterative; and on his authority they were at one time much employed; but they are now leſs extenſively uſed than formerly.

CHAP. XL.

CATAPLASMS.

By cataplaſms are in general underſtood thoſe external applications which are brought to a due conſiſtence or form for being properly applied, not by means of oily or fatty matters, but by water or watery fluids. Of theſe many are had recourſe to in actual practice; but they are ſeldom prepared in the ſhops of the apothecaries; and in ſome of the beſt modern pharmacopœias no formula of this kind is introduced. The London and Dublin colleges, however, although they have abridged the number of cataplaſms, ſtill retain a few; and it is not without ſome advantage that there are fixed forms for the preparation of them.

CATAPLASMA ALUMINIS. *Lond.*

Cataplaſm of Alum.

COAGULUM ALUMINOSUM. *Dub.*

Alum Curd.

Take of

The white of two eggs, (any quantity, *Dub.*)

Shake them with a piece of alum till they be coagulated.

THIS preparation is taken from Riverius. It is an uſeful aſtringent epithem for ſore moiſt eyes. Where the complaint is violent, this preparation, after the inflammation has yielded a little to bleeding, is one of the beſt external remedies. It is to be ſpread on lint, and applied at bed time.

CATAPLASMA CUMINI. *Lond.*

Cataplaſm of Cummin.

Take of

Cummin ſeed, one pound;
Bay berries,
Dry leaves of water germander, or ſcordium,
Virginian ſnake root, of each three ounces;
Cloves, one ounce.

Rub them all together to powder; and, with the addition of three times the weight of honey, make a cataplaſm.

THIS was intended as a reformation of the *Theriaca Londinenſis*, which for ſome time paſt has been ſcarcely otherwiſe uſed than as a warm cataplaſm. In place of the numerous articles which formerly entered that compoſition, only ſuch of its ingredients are retained as contribute moſt to this intention: but even the article from which it now derives its name, as well as ſeveral others which ſtill enter, probably contribute very little to any medical properties it may poſſeſs.

CATAPLASMA SINAPEOS. *Lond.* CATAPLASMA SINAPINUM. *Dub.*

Muſtard Cataplaſm.

Take of
Muſtard ſeed, powdered,
Crumb of bread, of each half a pound;
Vinegar, as much as is ſufficient.
Mix and make a cataplaſm.

CATAPLASMS of this kind are commonly known by the name of *Sinapiſms*. They were formerly frequently prepared in a more complicated ſtate, containing garlic, black ſoap, and other ſimilar articles; but the above ſimple form will anſwer every purpoſe which they are capable of accompliſhing. They are employed only as ſtimulants: they often inflame the part and raiſe bliſters, but not ſo perfectly as cantharides. They are frequently applied to the ſoles of the feet in the low ſtate of acute diſeaſes, for raiſing the pulſe and relieving the head. The chief advantage they have depends on the ſuddenneſs of their action.

CHAP. XLI.

LINIMENTS, OINTMENTS, CERATES, and PLASTERS.

THESE are all combinations of fixed oil, or animal fat, with other ſubſtances, and differ from each other only in conſiſtence. Deyeux has, indeed, lately defined plaſters to be combinations of oil with metallic oxides; but as this would comprehend many of our preſent ointments, and exclude many of our plaſters, we ſhall adhere to the old meaning of the terms.

Liniments are the thinneſt of theſe compoſitions, being only a little thicker than oil.

Ointments have generally a degree of conſiſtence like that of butter.

Cerates are firmer, and contain a larger proportion of wax.

Plaſters are the moſt ſolid, and when cold ſhould be firm, and ſhould not adhere to the fingers; but when gently heated, ſhould become ſufficiently ſoft to ſpread eaſily, and ſhould then adhere to the ſkin. Plaſters derive their firmneſs, either from a large proportion of wax, roſin, &c. or from the preſence of ſome metallic oxide, ſuch as that of lead.

Plaſters ſhould have ſuch a conſiſtence, that when cold they do not adhere to the fingers, but become ſoft and plaſtic when gently heated. The heat of the body ſhould render it tenacious enough to adhere to the ſkin, and to the ſubſtance on which it is ſpread. When prepared, it is uſually formed into rolls, and incloſed in paper. Plaſters of a ſmall ſize are often ſpread on leather, ſometimes on ſtrong paper, by means of a ſpatula gently heated, or the thumb. The leather is cut of the ſhape wanted, but ſomewhat larger; and the margin all round, about ¼ inch in breadth is left uncovered, for its more eaſy removal when neceſſary. Linen is alſo often uſed, eſpecially for the leſs active plaſters, which are uſed as dreſſings, and often renewed. It is generally cut into long ſlips of various breadths, from one to ſix inches. Theſe may either be dipt into the melted plaſter, and paſſed through two pieces of ſtraight and ſmooth wood, held firmly together, ſo as to remove any exceſs of plaſter; or, what is more elegant, they are ſpread on one ſide only, by ſtretching the linen, and applying the plaſter, which has been melted and allowed to become almoſt cold, evenly by means of a ſpatula, gently heated, or, more accurately, by paſſing the linen on which the plaſter has been laid, through a machine formed of a ſpatula fixed, by ſcrews, at a proper diſtance from a plate of poliſhed ſteel.

To prevent repetition, the Edinburgh college give the following canon for the preparation of theſe ſubſtances.

In making theſe compoſitions, the fatty and reſinous ſubſtances are to be melted with a gentle heat, and then conſtantly ſtirred, adding, at the ſame time, the dry ingredients, if there be any, until the mixture, on cooling, becomes ſtiff. (*Ed.*)

ADIPIS SUILLÆ, SEVIQUE OVILLI, PRÆPARATIO. *Lond.*

The Preparation of Hog's Lard and Mutton Suet.

Cut them into pieces, and melt them over a ſlow fire; then ſeparate them from the membranes by ſtraining.

Before proceeding to melt theſe fats, it is better to ſeparate as much of the membranes as poſſible, and to waſh them in repeated quantities of water until they no longer give out any colour. Over the fire hey become erfectlyp tranſp arent, and if they do not crackle on throwing a few drops into the fire, it is a ſign that all the water is evaporated, and that the fats are ready for ſtraining, which ſhould be done through a linen cloth without expreſſion. The reſiduum may be repeatedly melted with a little water, until it become diſcoloured with the fire. The fluid fat ſhould be poured into the veſſels, or bladders, in which it is to be preſerved.

Theſe articles had formerly a place alſo among the preparations of the Edinburgh college. But now they introduce them only into their liſt of the materia medica; as the apothecary will in general find it more for his intereſt to purchaſe them thus prepared, than to prepare them for himſelf; for the proceſs requires to be very cautiouſly conducted, to prevent the fat from burning or turning black.

LINIMENTUM SIMPLEX. *Ed.*

Simple Liniment.

Take of
Olive oil, four parts;
White wax, one part.

This conſiſts of the ſame articles which form the Unguentum ſimplex of the Edinburgh pharmacopœia, but merely in a different proportion, ſo as to render the compoſition thinner; and where a thin conſiſtence is requiſite, this may be conſidered as a very elegant and uſeful application.

Off. prep.—Ungt. oxidi zinci impuri, *Ed.* Ungt. oxidi zinci, *Ed.*

UNGUENTUM APIDIS SUILLÆ. *Lond.*

Ointment of Hog's Lard.

Take of
Prepared hog's lard, two pounds;
Roſe water, three ounces.

Beat the lard with the roſe water until they be mixed; then melt the mixture with a ſlow fire, and ſet it apart that the water may ſubſide; after which, pour off the lard from the water, conſtantly ſtirring it until it be cold.

In the laſt edition of the London pharmacopœia, this was ſtyled *Unguentum ſimplex*, the name given by the Edinburgh college to the following preparation.

Off. prep.—Ungt. helleb. albi, *Lond.* Ungt. ſulph. *Lond. Dub.* Ungt. calcis hydrarg. albi, *Lond.* Ungt. tutiæ, *Dub.*

UNGUENTUM SIMPLEX. *Ed.*

Simple Ointment.

Take of
  Olive oil, five parts;
  White wax, two parts.

Both theſe ointments may be uſed for ſoftening the ſkin and healing chaps. The laſt is, however, preferable, as being more ſteadily of one uniform conſiſtence. For the ſame reaſon it is alſo to be preferred as the baſis of other more compounded ointments.

Off. prep.—Ungt. oxidi plumbi albi, *Ed.* Ungt. acet plumbi, *Ed.*

UNGUENTUM SPERMATIS CETI. *Lond. Dub.*

Ointment of Spermaceti.

Take of
  Spermaceti, ſix drachms;
  White wax, two drachms;
  Olive oil, three ounces.
Melt them together over a ſlow fire, ſtirring them conſtantly and briſkly until they be cold.

This had formerly the name of *Linimentum album*, and it is perhaps only in conſiſtence that it can be conſidered as differing from the unguentum ſimplex, already mentioned, or the ceratum ſimplex, afterwards to be taken notice of.

Off. prep.—Ungt. tutiæ, *Lond.*

UNGUENTUM CERÆ. *Lond. Dub.*

Wax Ointment.

Take of
  White wax, four ounces;
  Spermaceti, three ounces;
  Olive oil, one pint, (fourteen ounces, *Dub.*)
Stir them, after being melted with a ſlow fire, conſtantly and briſkly, until cold.

This ointment had formerly the title of *Unguentum album* in the London pharmacopœia. It differs very little from the Unguentum ſimplex of the Edinburgh pharmacopœia, and in nothing from the Unguentum ſpermatis ceti of the other pharmacopœias, excepting that in this ointment the proportion of wax is four times greater. It is an uſeful cooling ointment for excoriations and other frettings of the ſkin.

Off. prep.—Cerat. carb. zinci impuri, *Ed.*

CERATUM SIMPLEX. *Ed.*

Simple Cerate.

Take of
  Olive oil, ſix parts ;
  White wax, three parts ;
  Spermaceti, one part.

This differs from the ſimple ointment, in containing a greater proportion of wax to the oil, and in the addition of the ſpermaceti. But by theſe means it obtains only a more firm conſiſtence, without any eſſential change of properties.

Off. prep.—Cerat cantharidis, *Lond. Dub.*

CERATUM SPERMATIS CETI. *Lond. Dub.*

Cerate of Spermaceti.

Take of
  Spermaceti, half an ounce ;
  White wax, two ounces ;
  Olive oil, four ounces.
Melt them together, and ſtir until the cerate be cold.

This had formerly the name of *Ceratum album*, and it differs in nothing from the Unguentum ſpermatis ceti, or Linimentum album, as it was formerly called, excepting in conſiſtence, both the wax and the ſpermaceti bearing a greater proportion to the oil.

UNGUENTUM RESINÆ FLAVÆ. *Lond. Dub.*

Ointment of Yellow Reſin.

Take of
  Yellow reſin,
  Yellow wax, of each one pound ;
  Olive oil, one pint, (ſeven ounces, *Dub.*)
Melt the reſin and wax with a ſlow fire ; then add the oil and ſtrain the mixture while hot.

UNGUENTUM RESINOSUM. *Ed.*

Reſinous Ointment.

Take of
  Hog's-lard, eight parts ;
  White reſin, five parts ;
  Yellow wax, two parts.

These are commonly employed in dreſſings, for digeſting, cleanſing, and incarnating, wounds and ulcers.

Off. prep.—Cerat. reſin. flav. *Lond. Dub.* Ungt. canth. *Lond. Dub.* Ungt. pulv. mel veſic, *Ed.* Ungt. ſub-acet. cupri, *Ed.*

CERATUM RESINÆ FLAVÆ. *Lond. Dub.*

Cerate of Yellow Reſin.

Take of
Ointment of yellow reſin, half a pound;
Yellow wax, one ounce.
Melt them together, and make a cerate.

This had formerly the name of *Unguentum citrinum.* It is no otherwiſe different from the Yellow baſilicum, or Unguentum reſinæ flavæ, then being of a ſtiffer conſiſtence, which renders it for ſome purpoſes more commodious.

EMPLASTRUM CERÆ. *Dub.* EMPLASTRUM CERÆ COMPOSITUM. *Lond.*

Compound Wax Plaſter.

Take of
Yellow wax,
Prepared mutton ſuet, of each three pounds;
Yellow reſin, one pound.
Melt them together, and ſtrain the mixture while it is fluid.

EMPLASTRUM SIMPLEX, SIVE EMPLASTRUM CEREUM. *Ed.*

Simple or *Wax Plaſter.*

Take of
Yellow wax, three parts;
Mutton ſuet,
White reſin, each two parts.

This plaſter had formerly the title of *Emplaſtrum attrahens*, and was chiefly employed as a dreſſing after bliſters, to ſupport ſome diſcharge, and it is a very well contrived plaſter for that purpoſe. Sometimes, however, it irritates too much on account of the reſin; and hence, when deſigned only for dreſſing bliſters, the reſin ought to be entirely omitted, unleſs where a continuance of the pain and irritation, excited by the veſicatory, is required. Indeed, plaſters of any kind are not very proper for dreſſing bliſters; their conſiſtence makes them ſit uneaſy, and their adheſiveneſs renders the taking them off painful. Cerates, which are ſofter and leſs adheſive, appear much more eligible: the Ceratum ſpermatis ceti will ſerve for general uſe; and for ſome particular purpoſes, the Ceratum reſinæ flavæ may be applied.

Off. prep.—Empl. canth. *Lond. Dub.*

UNGUENTUM ELEMI. *Dub.* UNGUENTUM ELEMI COMPOSITUM. *Lond.*

Compound Ointment of Elemi.

Take of
  Elemi, one pound,
  Turpentine, ten ounces;
  Mutton ſuet, prepared, two pounds;
  Olive oil, two ounces.

Melt the elemi with the ſuet; and having removed it from the fire, mix it immediately with the turpentine and oil; after which ſtrain the mixture.

THIS ointment, formerly known by the name of *Linimentum Arcæi*, has long been uſed for digeſting, cleanſing, and incarnating; and for theſe purpoſes is preferred by ſome ſurgeons to all the other compoſitions of this kind, probably becauſe it is more expenſive.

UNGUENTUM PICIS. *Lond. Dub.*

Tar Ointment.

Take of
  Tar,
  Mutton ſuet, prepared, of each half a pound.

Melt them together, and ſtrain.

Edin.

Take of
  Tar, five parts;
  Yellow wax, two parts.

THESE compoſitions cannot be conſidered as differing eſſentially from each other. As far as they have any peculiar activity, this entirely depends on the tar. From the empyreumatic oil and ſaline matters which it contains, it is undoubtedly of ſome activity.

Accordingly, it has been ſucceſsfully employed againſt ſome cutaneous affections, particularly tinea capitis.

EMPLASTRUM PICIS BURGUNDICÆ. *Dub.* EMPLASTRUM PICIS COMPOSITUM. *Lond.*

Compound Burgundy Pitch Plaſter.

Take of
- Burgundy pitch, two pounds;
- Ladanum, (Galbanum, *Dub.*) one pound;
- Yellow reſin,
- Yellow wax, of each four ounces;
- Expreſſed oil of mace, one ounce.

To the pitch, reſin, and wax, melted together, add firſt the ladanum, (galbanum, *Dub.*), and then the oil of mace.

EMPLASTRUM CUMINI. *Lond.*

Cummin Plaſter.

Take of
- Cummin ſeeds,
- Caraway ſeeds,
- Bay berries, of each three ounces;
- Burgundy pitch, three pounds;
- Yellow wax, three ounces.

Melt the pitch and wax together, and mix with them the reſt of the ingredients, powdered, and make a plaſter.

THIS plaſter has been recommended as a moderately warm diſcutient; and is directed by ſome to be applied to the hypogaſtric region, for ſtrengthening the viſcera, and expelling flatulencies: but it is a matter of great doubt, whether it derives any virtue, either from the article from which it is named, or from the caraway ſeeds or bay-berries which enter its compoſition.

EMPLASTRUM LADANI COMPOSITUM. *Lond.*

Compound Ladanum Plaſter.

Take of
- Ladanum, three ounces;
- Frankincenſe, one ounce;
- Cinnamon, powdered,
- Expreſſed oil of mace, of each half an ounce;
- Eſſential oil of mint, one drachm.

To the melted frankincenſe, add firſt the ladanum, ſoftened by heat; then the oil of mace. Mix theſe afterwards with the cinnamon and oil of mint, and beat them together, in a warm mortar, into a plaſter. Let it be kept in a cloſe veſſel.

This has been conſidered as a very elegant ſtomach plaſter. It is contrived ſo as to be eaſily made occaſionally, (for theſe kinds of compoſitions, on account of their volatile ingredients, are not fit for keeping), and to be but moderately adheſive, ſo as not to offend the ſkin, and that it may, without difficulty, be frequently renewed; which theſe ſorts of applications, in order to their producing any conſiderable effect, require to be.

UNGUENTUM SAMBUCI. *Lond.* UNGUENTUM SAMBUCINUM. *Dub.*

Elder Ointment.

Take of

Elder flowers, four pounds;
Mutton ſuet, prepared, three pounds;
Olive oil, one pint.

Boil the flowers in the ſuet and oil, till they be almoſt criſp; then ſtrain with expreſſion.

Compositions of this kind were formerly very frequent; but vegetables, by boiling in oils, impart to them nothing but a little mucilage, which changes the greaſy oils to drying oils, and any reſin they may contain; but that alſo is never in ſuch quantity as to affect the nature of the oil. We, therefore, do not ſuppoſe that this ointment poſſeſſes any properties different from a ſimple ointment of the ſame conſiſtency.

UNGUENTUM CANTHARIDIS. *Lond.* UNGUENTUM CANTHARIDUM. *Dub.*

Ointment of Spaniſh Flies.

Take of

Spaniſh flies, powdered, two ounces;
Diſtilled water, eight ounces, (water, nine ounces, *Dub.*)
Ointment of yellow reſin, eight ounces.

Boil the water with the Spaniſh flies to one half, and ſtrain. To the ſtrained liquor add the ointment of yellow reſin. Evaporate this mixture to the thickneſs of an ointment in a water-bath, ſaturated with ſea-ſalt.

UNGUENTUM INFUSI MELOES VESICATORII; vulgo, UNGUENTUM EPISPASTICUM MITIUS. *Ed.*

Ointment of Infuſion of Cantharides, commonly called *Mild Epiſpaſtic Ointment.*

Take of
Cantharides,
White reſin,
Yellow wax, each one part;
Hog's lard,
Venice turpentine, each two parts;
Boiling water, four parts.

Infuſe the cantharides in the water for a night; then ſtrongly preſs out and ſtrain the liquor, and boil it with the lard till the water be conſumed; then add the reſin and wax; and when theſe are melted, take the ointment off the fire and add the turpentine.

THESE ointments, containing the ſoluble parts of the cantharides, uniformly blended with the other ingredients, are more commodious, and in general occaſion leſs pain, though little leſs effectual in their action, than the compoſitions with the fly in ſubſtance. This, however, does not uniformly hold; and accordingly the Edinburgh college, with propriety, introduce the following.

UNGUENTUM PULVERIS MELOES VESICATORII; olim, UNGUENTUM EPISPASTICUM FORTIUS. *Edin.*

Ointment of the Powder of Spaniſh Flies, formerly *Stronger Epiſpaſtic Ointment.*

Take of
Reſinous ointment, ſeven parts;
Powdered cantharides, one part.

THIS ointment is employed in the dreſſings for bliſters, intended to be made *perpetual*, as they are called, or to be kept running for a conſiderable time, which in many chronic, and ſome acute caſes, is of great ſervice. Particular care ſhould be taken, that the cantharides employed in theſe compoſitions be reduced into very ſubtile powder, and that the mixtures be made as equal and uniform as poſſible. But with theſe precautions, there are ſome particular habits in which this ointment operates with even leſs pain than the former, while at the ſame time it is generally more effectual.

CERATUM CANTHARIDIS. *Lond. Dub.*

Cerate of Cantharides.

Take of
- Cerate of ſpermaceti, ſoftened with heat, ſix drachms, (one ounce, *Dub.*)
- Spaniſh flies, finely powdered, one drachm, (four ſcruples, *Dub.*)

Mix them.

Under this form cantharides may be made to act to any extent that is requiſite. It may ſupply the place either of the bliſtering plaſter or ointment; and there are caſes in which it is preferable to either. It is particularly more convenient than the emplaſtrum cantharidum, where the ſkin to which the bliſter is to be applied is previouſly much affected, as in caſes of ſmall pox; and in ſupporting a drain under the form of iſſue, it is leſs apt to ſpread than the ſofter ointment.

EMPLASTRUM CANTHARIDIS. *Lond. Dub.*

Plaſter of Spaniſh Flies.

Take of
- Spaniſh flies, finely powdered, one pound;
- Wax plaſter, two pounds;
- Prepared hog's lard, half a pound.

Having melted the plaſter and lard, ſprinkle and mix in the flies, a little before they become firm.

EMPLASTRUM MELOES VESICATORII; olim, EMPLASTRUM VESICATORIUM. *Ed.*

Plaſter of Spaniſh Flies, formerly *Bliſtering Plaſter.*

Take of
- Mutton ſuet,
- Yellow wax,
- White roſin,
- Cantharides, each equal weights.

Mix the cantharides, reduced to a fine powder, with the other ingredients, previouſly melted, and removed from the fire.

Both theſe formulæ are very well ſuited to anſwer the intention in view, that of exciting bliſters; for both are of a proper conſiſtence and ſufficient degree of tenacity, which are here the only requiſites. Cantharides of good quality, duly applied to the ſkin, never fail of producing bliſters. When, therefore, the deſired effect does not take place, it is to be aſcribed to the flies either being faulty at firſt, or having their activity afterwards deſtroyed by ſome accidental circumſtance; ſuch as too great heat in forming, or in ſpreading, the plaſter, or the like. It is therefore not unuſual to ſprinkle powder of cantharides on the bliſter after it is ſpread.

EMPLASTRUM MELOES VESICATORII COMPOSITUM. *Edin.*

Compound Plaſter of Spaniſh Flies.

Take of
Burgundy pitch,
Venice turpentine,
Cantharides, each twelve parts;
Yellow wax, four parts;
Sub-acetite of copper, two parts;
Muſtard ſeed,
Black pepper, each one part.

Having firſt melted the pitch and wax, add the turpentine, and to theſe, in fuſion, and ſtill hot, add the other ingredients, reduced to a fine powder, and mixed, and ſtir the whole carefully together, ſo as to form a plaſter.

This is ſuppoſed to be the moſt infallible bliſtering plaſter. It certainly contains a ſufficient variety of ſtimulating ingredients.

UNGUENTUM HELLEBORI ALBI. *Lond. Dub.*

Ointment of White Hellebore.

Take of
White hellebore, one ounce;
Ointment of hog's lard, (hog's lard, *Dub.*) four ounces;
Eſſence of lemon, half a ſcruple.

Mix, and make them into an ointment.

White hellebore externally applied has long been celebrated in the cure of cutaneous diſeaſes.

UNGUENTUM SULPHURIS. *Lond. Dub.*

Sulphur Ointment.

Take of
Ointment of hog's lard, half a pound, (five ounces, *Dub.*)
Flowers of ſulphur, four (three, *Dub.*) ounces.

Mix them, and make an ointment.

Edin.

Take of
  Hog's lard, four parts;
  Sublimed ſulphur, one part.
To each pound of this ointment add,
  Volatile oil of lemons, or
  ———— of lavender, half a drachm.

Sulphur is a certain remedy for the itch, more ſafe than mercury. A pound of ointment ſerves for four unctions. The patient is to be rubbed every night, a fourth part of the body at each time. Though the diſeaſe may be thus cured by a ſingle application, it is in general adviſable to touch the parts moſt affected for a few nights longer, and to conjoin with the frictions the internal uſe of ſulphur.

UNGUENTUM ACIDI NITROSI. *Ed.*

Ointment of Nitrous Acid.

Take of
  Hog's lard, one pound;
  Nitrous acid, ſix drachms.
Mix the acid gradually with the melted axunge, and diligently beat the mixture as it cools.

The axunge in this ointment ſeems to be oxidized; for during the action of the acid upon it, there is a great deal of nitric oxide gas diſengaged. It acquires a yellowiſh colour, and a firm conſiſtency; and forms an excellent and cheap ſubſtitute, in ſlight herpetic and other cutaneous affections, for the ointment of nitrate of mercury.

EMPLASTRUM OXIDI PLUMBI SEMIVITREI; olim, EMPLASTRUM COMMUNE. *Ed.*

Plaſter of the Semi-vitrified Oxide of Lead, formerly *Common Plaſter.*

Take of
  Semi-vitrified oxide of lead, one part;
  Olive oil, two parts.
Boil them, adding water, and conſtantly ſtirring the mixture till the oil and litharge be formed into a plaſter.

EMPLASTRUM LITHARGYRI. *Lond. Dub.*

Litharge Plaſter.

Take of
Litharge, in very fine powder, five pounds;
Olive oil, a gallon, (nine pounds, *Dub.*)
Water, two pints, (two pounds, *Dub.*)
Boil them with a ſlow fire, conſtantly ſtirring until the oil and litharge unite, ſo as to form a plaſter. (But it will be proper to add more boiling water, if the water that was firſt added be nearly conſumed before the end of the proceſs. *Lond.*)

Oxides of lead, boiled with oils, unite with them into a plaſter of an excellent conſiſtence, and which makes a proper baſis for ſeveral other plaſters.

In the boiling of theſe compoſitions, a quantity of water muſt be added, to prevent the plaſter from burning and growing black. Such water as it may be neceſſary to add during the boiling, muſt be previouſly made hot; for cold liquor would not only prolong the proceſs, but likewiſe occaſion the matter to explode, and be thrown about with violence, to the great danger of the operator: this accident will equally happen upon the addition of hot water, if the plaſter be extremely hot. It is therefore better to remove it from the fire a little before each addition of water.

Theſe plaſters, which have been long known under the name of Diachylon, are common applications in excoriations of the ſkin, ſlight fleſh wounds, and the like. They keep the part ſoft and ſomewhat warm, and defend it from the air, which is all that can be expected in theſe caſes from any plaſter.

Off. prep.—Emp. oxidi ferri rubri, *Ed.* Emplaſt. hydrarg. *Ed.* Emp. thuris comp. *Ed.* Emplaſt. ſap. *Ed. Lond. Dub.* Emplaſt. lith. comp. *Lond.* Emp. gum. *Ed.* Emp. aſſæ fœtid. *Ed.* Emp. lith. cum reſina, *Lond.* Emplaſt. reſin. *Ed.* Empl. lith. cum hydrarg. *Lond.*

EMPLASTRUM RESINOSUM; vulgo, EMPLASTRUM ADHÆSIVUM. *Ed.*

Reſinous Plaſter, commonly called *Adheſive Plaſter.*

Take of
Plaſter of ſemi-vitrified oxide of lead, five parts;
White reſin, one part.
Melt them together, and make a plaſter.

EMPLASTRUM LITHARGYRI CUM RESINA. *Lond.*
Litharge Plaſter with Reſin.

Take of
Litharge plaſter, three pounds;
Yellow reſin, half a pound.

To the litharge plaſter, melted with a very ſlow fire, add the powdered reſin; mix them well, and make a plaſter.

THESE plaſters are chiefly uſed as adheſives for keeping on other dreſſings, for retaining the edges of recent wounds together, when we are endeavouring to cure them by the firſt intention, and for giving mechanical ſupport to new fleſh, and contracting the ſize of ulcers, in the manner recommended by Mr. Baynton, for the cure of ulcers of the legs.

EMPLASTRUM ASSÆ FOETIDÆ; vulgo, EMPLASTRUM ANTI-HYSTERICUM. *Ed.*
Plaſter of Aſſa fœtida, commonly called *Anti-hyſteric Plaſter.*

Take of
Plaſter of ſemi-vitrified oxide of lead,
Aſſa fœtida, each two parts;
Galbanum,
Yellow wax, each one part.

THIS plaſter is applied to the umbilical region, or over the whole abdomen, in hyſteric caſes; and ſometimes with good effect; but probably more from its effect as giving an additional degree of heat to the part, than from any influence derived from the fetid gums.

EMPLASTRUM GUMMOSUM. *Ed.*
Gum Plaſter.

Take of
Plaſter of ſemi-vitrified oxide of lead, eight parts;
Gum ammoniacum,
Galbanum,
Yellow wax, each one part.

Off. prep.—Emplaſt. ſapon. *Ed.*

EMPLASTRUM LITHARGYRI COMPOSITUM. *Lond.*
Compound Plaſter of Litharge.

Take of
- Litharge plaſter, three pounds;
- Strained galbanum, eight ounces;
- Turpentine, ten drachms;
- Frankincenſe, three ounces.

The galbanum and turpentine being melted, mix with them the powdered frankincenſe, and afterwards the litharge plaſter, melted alſo with very ſlow fire, and make a plaſter.

Both theſe plaſters are uſed as digeſtives and ſuppuratives; particularly in abſceſſes, after a part of the matter has been maturated and diſcharged, for ſuppurating or diſcuſſing the remaining hard part; but it is very doubtful whether they derive any advantage from the gums entering their compoſition.

CERATUM SAPONIS. *Lond. Dub.*
Soap Cerate.

Take of
- Soap, (hard Spaniſh ſoap, *Dub.*) eight ounces;
- Yellow wax, ten ounces;
- Litharge, powdered, one pound;
- Olive oil, one pint, (fourteen ounces, *Dub.*)
- Vinegar, one gallon, (eight pounds, *Dub.*)

Boil the vinegar with the litharge, over a ſlow fire, conſtantly ſtirring, until the mixture unites and thickens; then mix in the other articles, and make a cerate.

Notwithstanding the name, this cerate may rather be conſidered as another ſaturnine application; its action depending very little on the ſoap.

EMPLASTRUM SAPONIS. *Lond.* EMPLASTRUM SAPONACEUM. *Dub.*
Soap Plaſter.

Take of
- Soap, one part;
- Litharge plaſter, ſix parts.

Mix the ſoap with the melted litharge plaſter, and boil them to the thickneſs of a plaſter.

EMPLASTRUM SAPONACEUM. *Edin.*
Saponaceous Plaſter.

Take of
- Plaſter of ſemi-vitrified oxide of lead, four parts;

Gum plaſter, two parts ;
Soap, ſliced, one part.
To the plaſters, melted together, add the ſoap ; then boil for a little, ſo as to form a plaſter.

These plaſters have been ſuppoſed to derive a reſolvent power from the ſoap ; and in the laſt, the addition of the gums is ſuppoſed to promote the reſolvent virtue of the ſoap : but it is a matter of great doubt, whether they derive any material advantage from either addition.

EMPLASTRUM THURIS COMPOSITUM. *Lond.*

Compound Frankincenſe Plaſter.

Take of
Frankincenſe, half a pound ;
Dragons blood, three ounces ;
Litharge plaſter, two pounds.
To the melted litharge plaſter add the reſt, powdered.

It has been ſuppoſed that plaſters compoſed of ſtyptic medicines conſtringe and ſtrengthen the part to which they are applied, but on no very juſt foundation ; for plaſters in general relax rather than aſtringe ; the unctuous ingredients neceſſary in their compoſition counteracting and deſtroying the effect of the others.

If conſtantly worn with a proper bandage, it will, in children, frequently do ſervice, though, perhaps, not ſo much from any ſtrengthening quality of the ingredients, as from its being a ſoft, cloſe, and adheſive, covering.

UNGUENTUM OXIDI PLUMBI ALBI ; vulgo, Unguentum Album. *Edin.*

Ointment of White Oxide of Lead, formerly *White Ointment.*

Take of
Simple ointment, five parts ;
White oxide of lead, one part.

This is a cooling deſiccative ointment, of great uſe when applied to excoriated ſurfaces.

UNGUENTUM ACETITIS PLUMBI ; vulgo, Unguentum Saturninum. *Edin.*

Ointment of Acetite of Lead, formerly *Saturnine Ointment.*

Take of
Simple ointment, twenty parts ;
Acetite of lead, one part.

UNGUENTUM CERUSSÆ ACETATÆ. *Lond. Dub.*

Ointment of Acetated Ceruſe.

Take of

Acetated ceruſe, two drachms;
White wax, two ounces;
Olive oil, half a pint, (half a pound, *Dub.*)

Rub the acetated ceruſe, previouſly powdered, with ſome part of the olive oil; then add it to the wax, melted with the remaining oil. Stir the mixture until it be cold.

THESE are alſo excellent cooling ointments, of the greateſt uſe in many caſes.

CERATUM LITHARGYRI ACETATI COMPOSITUM. *Lond.* CERATUM LITHARGYRI ACETATI. *Dub.*

Compound Cerate of Acetated Litharge.

Take of

Water of acetated litharge, two ounces and a half;
Yellow wax, four ounces;
Olive oil, nine ounces;
Camphor, half a drachm.

Rub the camphor with a little of the oil. Melt the wax with the remaining oil, and as ſoon as the mixture begins to thicken, pour in by degrees the water of acetated litharge, and ſtir conſtantly until it be cold; then mix in the camphor previouſly rubbed with oil.

THIS application has been rendered famous by the recommendations of Mr. Goulard. It is unqueſtionably in many caſes very uſeful. It cannot, however, be conſidered as varying eſſentially from the ſaturnine ointments already mentioned. It is employed with nearly the ſame intentions, and differs from them chiefly in conſiſtence.

UNGUENTUM HYDRARGYRI; vulgo, UNGUENTUM COERULEUM. *Edin.*

Ointment of Quickſilver, commonly called *Blue Ointment.*

Take of

Quickſilver,
Mutton ſuet, each one part.
Hog's lard, three parts.

Rub them carefully in a mortar till the globules entirely diſappear. This ointment may alſo be made with double or treble the quantity of quickſilver.

UNGUENTUM HYDRARGYRI FORTIUS. *Lond. Dub.*

Stronger Mercurial Ointment.

Take of
- Purified quickſilver, two pounds;
- Prepared hog's lard, twenty-three ounces;
- Prepared mutton ſuet, one ounce;

Firſt triturate the quickſilver with the ſuet and a little of the hog's lard, until the globules be extinguiſhed; then add the reſt of the lard, and form it into an ointment.

UNGUENTUM HYDRARGYRI MITIUS. *Lond. Dub.*

Milder Mercurial Ointment.

Take of
- The ſtronger ointment of quickſilver, one part;
- Hog's lard, prepared, two parts.

Mix them.

UNGUENTUM OXIDI HYDRARGYRI CINEREI. *Ed.*

Ointment of Grey Oxide of Quickſilver.

Take of
- Grey oxide of quickſilver, one part;
- Hog's lard, three parts.

These ointments are principally employed, not with a view to their topical action, but with the intention of introducing mercury in an active ſtate into the circulating ſyſtem; which may be effected by gentle friction on the ſound ſkin of any part, particularly on the inſide of the thighs or legs. For this purpoſe, theſe ſimple ointments are much better ſuited than the more compounded ones with turpentine and the like, formerly employed. For, by any acrid ſubſtance, topical inflammation is apt to be excited, preventing further friction, and giving much uneaſineſs. To avoid this, it is neceſſary, even with the mildeſt and weakeſt ointment, to change occaſionally the place at which the friction is performed.

It is requiſite that the ointments, in which the mercury is extinguiſhed by trituration, ſhould be prepared with very great care: for upon the degree of triture which has been employed, the activity of the mercury very much depends. The addition of the mutton ſuet, now adopted by both colleges, is an advantage to the ointment, as it prevents it from running into the ſtate of oil, which the hog's lard alone, in warm weather, or in a warm chamber, is ſometimes apt to do, and which is followed by a ſeparation of parts. We are even inclined to think, that the proportion of ſuet directed by the London college is too ſmall for this purpoſe, and indeed ſeems to be principally intended for the more effectual triture of the mercury: but it is much more to be regretted, that in a medicine of ſuch activity, the colleges ſhould not have directed the ſame proportion of mercury to the fatty matter.

If the efficacy of the ointment prepared with the grey oxide were ſufficiently eſtabliſhed, the facility and certainty of its preparation would be attended with great advantages.

EMPLASTRUM HYDRARGYRI. *Ed.*

Plaſter of Quickſilver.

Take of
- Olive oil,
- White reſin, each one part;
- Quickſilver, three parts;
- Plaſter of ſemi-vitrified oxide of lead, ſix parts.

Melt the oil and reſin together, and when this mixture is cold, let the quickſilver be rubbed with it till the globules diſappear; then add by degrees the litharge plaſter, melted, and let the whole be accurately mixed.

EMPLASTRUM AMMONIACI CUM HYDRARGYRO. *Lond.*

Plaſter of Gum Ammoniac with Quickſilver.

Take of
- Gum ammoniac, ſtrained, one pound;
- Purified quickſilver, three ounces;
- Sulphuretted oil, a drachm, or as much as may be neceſſary.

Triturate the quickſilver with the ſulphuretted oil, until its globules diſappear; then gradually add the gum ammoniac melted, and mix them.

EMPLASTRUM LITHARGYRI CUM HYDRARGYRO. *Lond.*

Litharge Plaſter with Quickſilver.

Take of
- Litharge plaſter, one pound;
- Purified quickſilver, three ounce;
- Sulphuretted oil, one drachm, or what is ſufficient.

Make the plaſter in the ſame manner as the ammoniacum plaſter with quickſilver.

These mercurial plaſters are conſidered as powerful reſolvents and diſcutients, acting with much greater certainty for theſe intentions than any compoſition of vegetable ſubſtances alone; the mercury exerting itſelf in a conſiderable degree, and being ſometimes introduced into the habit in ſuch quantity as to affect the mouth. Pains in the joints and limbs from a venereal cauſe, nodes, tophi, and beginning indurations, are ſaid to yield to them ſometimes.

UNGUENTUM CALCIS HYDRARGYRI ALBI. *Lond.*

Ointment of the White Calx of Quickſilver.

Take of
  The white calx of quickſilver, one drachm ;
  Ointment of hog's lard, one ounce and a half ;
Mix, and make an ointment.

This is a very elegant mercurial ointment, and frequently made uſe of in the cure of obſtinate cutaneous affections.

UNGUENTUM OXIDI HYDRARGYRI RUBRI. *Ed.*

Ointment of Red Oxide of Quickſilver.

Take of
  Red oxide of quickſilver by nitrous acid, one part ;
  Hog's lard, eight parts.

This is an excellent ſtimulating ointment, often of very great ſervice in indolent ill-conditioned ſores, when we wiſh to excite them to greater action. If it prove too ſtimulating, it may be diluted with axunge ; and in this ſtate it is often applied to the eyelids in chronic ophthalmia.

UNGUENTUM NITRATIS HYDRARGYRI; vulgo, UNGUENTUM CITRINUM. *Ed.* UNGUENTUM HYDRARGYRI NITRATI. *Lond. Dub.*

Ointment of Nitrate of Quickſilver, commonly called *Yellow Ointment. Ointment of Nitrated Quickſilver.*

Take of
  Quickſilver, one part ;
  Nitrous acid, two parts ;
  Hog's lard, twelve parts.
Diſſolve the quickſilver in the nitrous acid, by digeſtion in a ſand heat ; and, while the ſolution is very hot, mix with it the lard, previouſly melted by itſelf, and juſt beginning to grow ſtiff. Stir them briſkly together in a marble mortar, ſo as to form the whole into an ointment.

UNGUENTUM NITRATIS HYDRARGYRI MITIUS. *Ed.*

Milder Ointment of Nitrate of Quickſilver.

This is prepared in the ſame way, with three times the quantity of hog's lard.

This is an excellent application in herpes, tinea capitis, and many other ſimilar cutaneous affections, but it ſoon becomes very hard, and even pulverulent, ſo that it muſt be melted with ſome freſh axunge before it can be uſed. This is owing to the exceſs of acid uſed for diſſolving the quickſilver. To remedy this inconvenience, I prepared ſome with a nitrate of mercury, containing as little exceſs of acid as poſſible; but, on mixing it with the lard, I could not prevent the ſalt from cryſtallizing, and it became as hard as that prepared in the uſual way. But the property which nitrate of mercury, prepared by ebullition, has of being decompoſed by water, furniſhed me with an eaſy way of getting rid of all exceſs of acid, and of procuring the ſub-nitrate of mercury in the ſtate of the moſt minute diviſion poſſible. An ointment prepared with this ſub-nitrate had a moſt beautiful golden colour; after ſix months was perfectly ſoft, and ſucceeded perfectly in curing a very bad caſe of herpes.

UNGUENTUM SUB-ACETITIS CUPRI. *Ed.*

Ointment of Sub-Acetite of Copper.

Take of
Reſinous ointment, fifteen parts;
Sub-acetite of copper, one part.

This ointment is uſed for cleanſing ſores, and keeping down fungous fleſh. Where ulcers continue to run from a weakneſs in the veſſels of the parts, the tonic powers of copper promiſe conſiderable advantage.

It is alſo frequently uſed with advantage in caſes of ophthalmia, depending on ſcrofula, where the palpebræ are principally affected; but when it is to be thus applied, it is in general requiſite that it ſhould be ſomewhat weakened by the addition of a proportion of ſimple ointment or hog's lard.

UNGUENTUM OXIDI ZINCI IMPURI; olim, Unguentum Tutiæ. *Ed.*

Ointment of Impure Oxide of Zinc, formerly Ointment of Tutty.

Take of
Simple liniment, five parts;
Prepared impure oxide of zinc, one part.

UNGUENTUM TUTIÆ. *Lond. Dub.*

Ointment of Tutty.

Take of

Prepared tutty,

Ointment of ſpermaceti, (hog's lard, *Dub.*) as much as may be ſufficient.

Mix them ſo as to make a ſoft ointment.

UNGUENTUM OXIDI ZINCI. *Edin.*

Ointment of Oxide of Zinc.

Take of

Simple liniment, ſix parts;

Oxide of zinc, one part.

These ointments are chiefly uſed in affections of the eye, particularly in thoſe caſes where redneſs ariſes rather from relaxation than from active inflammation.

CERATUM CARBONATIS ZINCI IMPURI. *Edin.*

Cerate of Impure Carbonate of Zinc.

Take of

Simple cerate, five parts;

Prepared impure carbonate of zinc, one part.

CERATUM LAPIDIS CALAMINARIS; olim, Ceratum Epuloticum. *Lond. Dub.*

Calamine Cerate, formerly *Epulotic Cerate.*

Take of

Calamine, prepared,

Yellow wax, of each half a pound, (one part, *Dub.*)

Olive oil, one pint, (two parts, *Dub.*)

Melt the wax with the oil; and as ſoon as the mixture, expoſed to the air, begins to thicken, mix with it the calamine, and ſtir the cerate until it be cold.

These compoſitions reſemble the cerate which Turner ſtrongly recommends in cutaneous ulcerations and excoriations, and which has been uſually diſtinguiſhed by his name. They appear from experience to be excellent epulotics, and as ſuch are frequently made uſe of in practice.

EMPLASTRUM OXIDI FERRI RUBRI; olim, EMPLASTRUM ROBORANS. *Ed.*

Plaſter of Red Oxide of Iron, commonly called *Strengthening Plaſter.*

Take of
Plaſter of ſemi-vitrified oxide of lead, twenty-four parts;
White reſin, ſix parts;
Yellow wax,
Olive oil, each three parts;
Red oxide of iron, eight parts.

Grind the red oxide of iron with the oil, and then add it to the other ingredients previouſly melted.

THIS plaſter is uſed in weakneſſes of the large muſcles, as of the loins: and its effects ſeem to proceed from the artificial mechanical ſupport given to the part, which may alſo be done by any other plaſter that adheres with equal firmneſs.

TABLES,

Shewing the Proportion of ANTIMONY, OPIUM, *and* QUICKSILVER, *contained in some Compound Medicines.*

TARTRITE OF ANTIMONY.

Wine of Tartrite of Antimony contains two grains of tartrite of antimony, or tartar-emetic, in the ounce. *Ed.*

OPIUM

Opiate Confection contains one grain of opium in thirty-ſix grains. *Lond.*

Opiate, or *Thebaic Electuary*, contains in each drachm about a grain and a half of opium. *Edin.*

Electuary of Catechu, or *Japonic Confection*, contains in each ounce about two grains and a half of opium; for one grain of opium is contained in one hundred and ninety-three grains. *Ed.*

Compound Powder of Chalk with Opium contains one grain of opium in about forty-three grains. *Lond.*

Compound Powder of Ipecacuan contains one grain of opium in ten grains. *Lond.*

Powder of Ipecacuan and Opium contains ſix grains of opium in each drachm, or one grain in ten. *Ed.*

Opiate Powder contains one grain of opium in ten. *Lond.*

Pills of Opium contain one grain of opium in five. *Lond.*

Opiate or *Thebaic Pills* contain ſix grains of opium in each drachm, or five grains contain half a grain of opium. *Ed.*

Tincture of Opium or *Liquid Laudanum* is made with two ſcruples of opium in each ounce of the liquid, or with five grains in each drachm. But a drachm of the tincture appears, by evaporation, to contain about three grains and a half of opium. *Ed.*

Ammoniated Tincture of Opium, or *Paregoric Elixir*, is made with about eight grains in each ounce of the liquid, or with about one grain in the drachm. *Ed.*

Tincture of Soap with Opium, formerly called *Opiate Liniment*, *Anodyne Balſam*, is made with one ſcruple of opium in each ounce of the liquid. *Ed.*

Troches of Liquorice with Opium, contain about one grain of opium in each drachm. *Ed.*

QUICKSILVER.

Quickſilver Pills contain five grains of quickſilver in each drachm. Each pill contains one grain of quickſilver. *Ed.*

Quickſilver Pills contain four grains of quickſilver in twelve grains. *Lond.*

Quickſilver Ointment contains twelve grains of quickſilver in each drachm; made with double quickſilver, each drachm contains twenty-four grains. *Ed.*

Stronger Quickſilver Ointment contains one drachm of quickſilver in two drachms. *Lond.*

Weaker Quickſilver Ointment contains one drachm of quickſilver in ſix drachms.

Quickſilver Plaſter contains about ſixteen grains of quickſilver in each drachm. *Ed.*

Plaſter of Litharge with Quickſilver contains about one ounce of quicklver in five ounces. *Lond.*

Plaſter of Ammoniac with Quickſilver contains about one ounce of quickſilver in five ounces. *Lond.*

Powder of Scammony with Calomel contains one grain of calomel in four grains. *Lond.*

Ointment of Nitrated Quickſilver contains twelve grains of nitrated quickſilver in one drachm. *Lond.*

Stronger Ointment of Nitrate of Quickſilver contains in each drachm four grains of quickſilver and eight of nitrous acid. *Ed.*

Milder Ointment of Nitrate of Quickſilver contains in each ſcruple half a grain of quickſilver, and one grain of nitrous acid. *Ed.*

Ointment of White Calx of Quickſilver contains in each drachm about four grains and a half of the calx. *Lond.*

OR,

One grain of *Tartrite of Antimony* is contained in

Wine of tartrite of antimony. *Ed.*	grs. 240
Wine of antimoniated tartar. *Dub.*	120
Wine of tartariſed antimony. *Lond.*	120
Wine of antimony. *Lond.*	uncertain.

One grain of precipitated *Sulphuret of Antimony* is contained in

Compound pills of Antimony. *Dub.*	grs. 2.7

One grain of *Opium* is contained in

Opiate confection. *Lond.*	grs. 36
Opiate electuary. *Ed.*	43
Electuary of catechu. *Ed.*	193

One grain of *Opium* is contained in

Compound electuary of catechu. *Dub.*	grs. 199
Troches of liquorice with opium. *Ed.*	75
Compound troches of liquorice. *Dub.*	60
Pills of opium. *Lond.*	5
Opiate pills. *Ed.*	10
Opiate powder. *Lond.*	10
Compound powder of chalk with opium. *Lond.*	43
Compound powder of ipecacuan. *Lond. Dub.*	10
Powder of ipecacuan and opium. *Ed.*	10
Tincture of opium. *Edin. Lond. Dub.*	12
Camphorated tincture of opium. *Lond.*	244
Ditto ditto. *Dub.*	196
Ammoniated tincture of opium. *Ed.*	68
Tincture of ſoap with opium. *Ed.*	31.5

One grain of *Quickſilver* is contained in

Quickſilver pills. *Lond.*	grs. 3.
Ditto. *Dub.*	2.5
Ditto. *Edin.*	4
Stronger quickſilver ointment. *Lond. Dub.*	2
Weaker quickſilver ointment. *Lond. Dub.*	6
Quickſilver ointment. *Edin.*	5
Quickſilver plaſter. *Ed.*	5.5
Litharge plaſter with quickſilver. *Lond.*	5.
Ammoniac plaſter with quickſilver. *Lond.*	5.

One grain of *Calomel* is contained in

Powder of ſcammony with calomel. *Lond.*	4
Compound antimonial pills. *Dub.*	2.7

One grain of the *grey oxide of quickſilver* is contained in

Ointment of the grey oxide of quickſilver. *Ed.*	grs. 4

One grain of the *red oxide of quickſilver* is contained in

Ointment of red oxide of quickſilver. *Ed.*	grs. 9

One grain of *white calx of quickſilver* is contained in

Ointment of white calx of quickſilver. *Lond.*	grs. 13

One grain of *nitrate of mercury* is contained in

Stronger ointment of nitrate of mercury. *Ed.*	grs. 5
Ointment of nitrated quickſilver. *Lond. Dub.*	5
Milder ointment of nitrate of quickſilver. *Ed.*	13

In many inſtances theſe proportions are only to be conſidered as approximations to the truth, as they are calculated from the quantities of the ingredients taken to form the preparation, not from the quantities which exiſt in it after it is formed. The *nitrat of mercury*, for example, in the different ointments into which it enters, is eſtimated as equal to the whole quantity of mercury and nitrous acid employed to form it, although, from the very nature of the preparation, it cannot be ſo much. In the ſolutions of opium, the opium is eſtimated as equal to the whole quantity employed, although not above two thirds of it be diſſolved. Laſtly, no allowance is made for the loſs by evaporation; and hence, notwithſtanding the difference by calculation, the Edinburgh *troches of liquorice with opium* contain probably as much opium as thoſe of Dublin; for the former, being made with ſyrup, will loſe more in drying than the latter, which are made with extract of liquorice.

POSOLOGICAL and PROSODIAL TABLE.

ACETIS potaſſæ, ℈ i to ʒ i.
Acetītis ammonĭæ aqua, ʒ ij to ʒ vi.
Acĭdum acetōſum impurum, ʒ i to ℥ ſs; ℥ i to ℥ ij, *in glyſters.*
deſtillātum, do.
aromătĭcum *analeptic.*
forte, ℈ i to ʒ i.
camphorātum *analeptic.*
Acĭdi acetōſi ſyrupus, ʒ i to ʒ ij.
carbōnĭci aqua, ℔ ij *daily.*
Acĭdum benzoĭcum, g^{r} x to ʒ ſs.
muriāticum, g^{t} x to g^{t} xl.
nitrōſum, g^{t} v to g^{t} xx.
dilūtum, g^{t} x to xl.
ſuccĭnĭcum, g^{r} v to ℈ i.
ſulphŭrĭcum dilūtum, g^{t} xv to g^{t} xxx.
aromăticum, g^{t} xv to xxx.
Aconīti napelli herba, g^{r} i to g^{r} v.
ſuccus ſpiſſatus, g^{r} $\frac{1}{2}$ to g^{r} iij.
Acŏri călămi radix, ℈ i to ʒ i.
Aeſcŭli hippocaſtăni cortex ʒ ſs to ʒi.
Aether ſulphurĭcus, g^{t} xx to ʒ i.
cum alcohōle, ʒ ſs to ʒ ij.
cum alcohole aromatĭcus, ʒ ſs to ʒ ij.
Alcŏhol, ʒ ſs to ʒ i.
ammoniātum, ʒ ſs to ʒ i.
aromaticum ʒ ſs to ʒ i.
fœtidum, ʒ ſs to ʒ i.
ſuccinātum, g^{t} x to xl.

Allĭi ſatīvi radix, ʒ i to ʒ ij.
Alŏës perfoliātæ ſocotorīnæ ſuccus ſpiſſatus, gr v to xv.
pulvis cum canēlla, gr x to ℈ i.
pulvis cum ferro, gr v to ℈ i.
pulvis cum guāiăco, gr x to ℈ i.
pilŭlæ, gr xv to ʒ ſs.
pilulæ composĭtæ, gr x to xxv.
pilulæ cum aſſa fœtĭda, gr x to ℈ i.
cum cŏlŏcynthĭde, gr v to gr x.
cum myrrha, gr x to ℈ i.
tinctūra, ʒ ſs to ʒ ij.
tinctura cum myrrha, ʒ ſs to ʒ ij.
tinctura ætherĕæ, ʒ ſs to ʒ ij.
vīnum, ℥ ſs to ℥ iſs.
extractum, gr v to xv.
Althææ officinālis decoctum, ad libitum.
ſyrūpus, ʒ i to ʒ iij.
Alūmĭnæ ſulphas, ℈ ſs to ℈ i.
ſulphātis pulvis compoſitus, gr x to ʒ ſs.
Ammōniæ aqua, gt x to xv.
acetitis aqua, ℥ ſs.
hydro-ſulphurētum, gt v to xij.
carbōnas, gr v to gr xv.
carbōnātis aqua, gt xx to ʒ i.
Ammōniăcum gummi resīna, gr x to ʒ ſs.
Ammōniaci lac, ʒ iij to ℥ i.
Amōmi zingĭbĕris rādix, gr v to ℈ i.
ſyrupus, ʒ i to ʒ iij.
tinctura, ʒ i to ʒ iij.
repentis ſemina, gr v to ℈ i.
tinctura, ʒ i to ʒ iij.
tinctura compoſita, ʒ i to ʒ iij.
zedoārĭæ radix, ℈ i to ʒ i.
Amygdăli commūnis oleum fixum, ʒ iij to ℥ i.
emulſio, ℔ ij *daily*.
Amy̆li mucilāgo, ℥ iv to ℥ vj *in glyſter*.
trochīſci, ʒ i to ʒ ij.
Amȳrĭdis elĕmifĕræ reſina, gr x to ʒ ſs.
gileadenſis reſina, ℈ i to ʒ i.
Anēthi grăvĕŏlentis ſemĭna, ℈ i to ʒ i.
aqua deſtillata, ℥ i to ℥ iij.
fœnĭcŭli ſemina, ℈ i to ʒ i.
aqua deſtillāta, ℥ i to ℥ iij.
oleum volatĭle, gtt ij to gt v.
Angĕlĭcæ archangĕlĭcæ radix, herba, ſemen, ʒ ſs to ʒ iſs.
Anguſtūræ cortex, gr x to ℈ i.
Anthemĭdis nobĭlis flores, ℈ i to ʒ i.

Anthemĭdis nobĭlis decoctum, *in glyſter.*
extractum, gr x to ʒ i.
pyrēthri radix, gr iij to ℈ i.
Antimōnii ſulphurētum præparātum, gr xv to ℈ ij.
oxĭdum cum ſulphŭre per nitrātum potaſſæ, gr i to iv.
cum ſulphŭre vitrificātum, gr ¼ to iſs.
vitrificātum cum cēra, gr iij to ℈ i.
ſulphurētum fuſcum (*kermes mineralis*) gr i to iſs.
præcipitātum, gr i to iv.
oxĭdum cum phoſphāte calcis, gr iij to viij.
et potaſſæ tartris, gr i to i.
tartrĭtis vinum, ʒ ij to vi.
vinum, ʒ iij to ℥ ſs.
oxĭdum album, (*Antimonium calcinatum*) gr x to ʒ ſs.
pilulæ compoſitæ, gr iij to v.
Apĭi petrŏſĕlīni ſemĭna, ℈ i to ij.
Arbŭtī uvæ urſi folia, gr x to ℈ ij.
Arctĭi lappæ radix, *a decoction of* ℥ ij *in* ℔ ij *of water, daily.*
Argenti nitras, gr ⅛ to ½.
Ari maculāti radix, gr vi to ℈ i.
conſerva, ʒ ſs to ʒ iſs.
Ariſtolōchiæ ſerpentāriæ radix, ℈ i to ʒ i.
tinctura, ʒ i to ʒ iij.
Arnĭcæ montānæ herba, gr v to x.
Arſenĭci oxĭdum album, gr ⅛.
Artĕmiſiæ abrŏtăni folia, ℈ i to ʒ i.
marĭtĭmæ cacūmina, ℈ i to ʒ i.
conſerva, ʒ ij to ℥ ſs.
ſantonĭcæ cacūmina, ʒ ſs to ʒ i.
abſinthĭi herba, ℈ i to ℈ ij.
Aſări europææ folia, gr ij to iv.
pulvis compoſitus, gr v to ℈ i.
Aſtragăli tragăcanthæ pulvis compoſitus, ʒ ſs to ʒ iſs.
Atrŏpæ bĕlladonnæ folia, gt ſs to gr v.
ſuccus ſpiſſatus, gr ¼ to gr iij.
Barytæ muriātis ſolūtio, gr v to x.
Bitūmen petrolĕum ſulphurātum, gr v to xxx.
Bitūminis petrolĕi olĕum, gt x to xxx.
Bōlus gallĭcus, ℈ i to ʒ i.
Bubōnis galbăni gummi reſīna, gr x to ℈ i.
pilŭlæ compoſitæ, gr x to ʒ ſs.
tinctūra, ʒ i to iij.
Calcis aqua, ℥ iv to ℔ i *daily.*
muriātis ſolūtio, gt xl to ʒ i.
carbōnas præparātus, ℈ i to ʒ i.
carbōnātis miſtūra, ℥ i to ij.
pulvis compoſĭtus, ℈ i to ij.

Calcis carbōnātis pulvis compoſitus cum opio, g^r xv to ℈ ij.
trochiſci, ʒ i to ij.
Cancri aſtăci lapilli præparāti, ʒ t to i.
pagūri chēlæ præparātæ, ʒ ſs to i.
chelarum pulvis compoſitus, ℈ i to ij.
Canellæ albæ cortex, g^r xv to ℈ ij.
Capsĭci annui fructus, g^r v to x.
Cardamīnes prătenſis flores, ʒ ſs to ʒ i.
Cari carŭi ſemĭna, g^r x to ʒ i.
oleum volatile, g^t i to v.
ſpiritus, ʒ ij to ℥ i.
Caryophylli arŏmatĭci floris germen, g^r v to ℈ i.
oleum volatile, g^t iij to v.
Caſſiæ fiſtŭlæ pulpa, ℥ ſs to i.
electuarium, ʒ ij to ℥ i.
ſennæ folia, ℈ i to ʒ i.
pulvis compoſitus, ℈ i to ʒ i.
infūſum, ℥ i to iij.
infūſum tartariſātum, ℥ iſs to iij.
tinctura, ℥ ſs to ℥ i.
electuārium, ʒ i to ℥ ſs.
extractum, g^r x to ʒ ſs.
Caſtŏrĕum roſsĭcum, g^r x to ℈ i.
Caſtorei tĭnctūra, ʒ i to ij.
composĭta, ʒ ſs to i.
Centaureæ benĕdictæ herba, g^r xv to ʒ i.
Cephaëlĭdis ipecacŭanhæ radix, ℈ i to ʒ ſs.
vinum, ℥ ſs to ℥ i.
pulvis compoſitus, ℈ ſs to ℈ i.
Cēra, ℈ i to ʒ i, *in emulſion.*
Cervi elăphi cornu decoctum, ℥ ij to iv.
uſtum, ʒ ſs to i ſs.
Chironĭæ centaurĕi ſummitates, ℈ i to ʒ i.
Cinăræ ſcōlymi folia, ℥ ſs to i, *of the expreſſed juice.*
Cinchōnæ officinālis cortex, ℈ i to ʒ ij.
decoctum, ℥ i to iv.
infūſum, ℥ i to iv.
tinctūra, ʒ i to ʒ ij.
tinctūra ammoniata, ʒ ſs to ij.
tinctūra compoſita, ʒ i to iij.
extractum, g^r x to ℈ i.
extractum cum resīna, g^r v to ℈ i.
Ciſſampĕli parciræ radix, g^r xv to ℈ ij.
Ciſti cretĭci resīna (Ladănum), g^r x to ʒ ſs.
Citri aurantĭi folia, flores, g^r x to ʒ i.
fructus cortex exterior, ʒ ſs to ℈ ij.
aqua deſtillata, ℥ i to iij.

Citri aurantĭi, ſyrūpus corticis, ʒ i to ij.
tinctūra corticis, ʒ i to ij.
conſerva cortĭcis, ʒ ij to v.
medĭcæ, ſuccus expreſſus, ʒ i to ℥ ſs.
ſuccus ſpiſsātus, ʒ i to ℥ ij.
ſyrūpus ſucci, ʒ i to iij.
fructus cortex exterior, ℥ ſs to ij, *in infuſion.*
aqua deſtillata, ℥ i to iij.
oleum volatile, gt ii to gt v.
Cochlearĭæ officinālis herba, ℥ i to iv, *of the juice.*
ſuccus compoſitus, ℥ i to iv.
armoracĭæ radix, ℈ i to ʒ i.
ſpirĭtus compoſĭtus, ʒ iij to ℥ i.
Colchĭci autumnālis radix, gr ſs to iij.
ſyrūpus, ʒ i to ℥ i.
oxymel, ʒ i to ℥ ſs.
Cŏlombæ rādix, gr x to ℈ i.
tinctura, ʒ i to iij.
Confectio aromatĭca, gr xv to ʒ i.
opiāta, gr x to ʒ ſs.
Conĭi maculati folia, gr iij.
ſuccus ſpiſsātus, gr $\frac{1}{2}$ to gr iij.
Convolvŭli ſcammōnĭæ gummi reſīna, gr v to gr xv.
pulvis compoſĭtus, gr x to gr xv.
pulvis cum aloe, gr x to xv.
pulvis cum calomelăne, gr x to ℈ i.
electuārium, ʒ ſs to i.
jalapæ radix, gr x to ʒ ſs.
pulvis compoſitus, ʒ ſs to ʒ i.
tinctura, ʒ i to iij.
extractum, ℈ ſs to ℈ i.
Copaifĕræ officinālis reſīna, gt xv to ʒ ſs.
Corĭandri ſatīvi ſemĭna, ℈ i to ʒ i.
Croci ſatīvi floris ſtigmăta, gr v to ʒ ſs.
ſyrūpus, ʒ i to ij.
tinctūra, ʒ ſs to ij.
Crotōnis eleutheriæ cortex, ℈ i to ʒ ſs.
extractum, gr x to ʒ ſs.
tinctūra, ʒ i to ℥ ſs.
Cŭcŭmis cŏlŏcynthĭdis fructus medulla, gr iij to viij.
extractum compoſĭtum, gr v to ʒ ſs.
Cumīni cymīni ſemina, ℈ i to ʒ i.
Cupri ſub-acētis, gr $\frac{1}{8}$ to $\frac{1}{2}$.
ammoniarētum, gr $\frac{1}{2}$ to v.
ammoniarēti pilulæ, No. i.
aqua ammoniareti, gt v to gt xxx.
ſulphas, gt ij to x.

Curcumæ longæ radix, ℈ i to ʒ i.
Daphnes mezerĕi radīcis cortex, gt i to x.
Daphnes mezerĕi decoctum, ℥ iv to ℔ ſs.
Datūræ ſtramonĭi herba, gr i to v.
Dauci carotæ ſemĭna, ℈ i to ʒ i.
Delphinĭi ſtaphiſāgrĭæ ſemina, gr iij to x.
Dianthi caryophylli flores, ℈ i to ʒ i.
ſyrūpus, ʒ i to ij.
Digitālis purpŭreæ folia, gr ſs to iij.
infuſum, ʒ iij to ℥ i.
tinctura, gr x to xl.
Dŏlĭchi prurĭentis pubes leguminis rigida, gr v to x.
Dorſtēnĭæ contrayērvæ radix, ℈ i to ʒ ſs.
pulvis compoſitus, ℈ i to ij.
Electuarium opiātum, ℈ i to ij.
Eryngĭi maritĭmi radix, ʒ ij to iij.
Ferri limatura, gr iij to gr x.
oxĭdum nigrum purificātum, do.
carbōnas, do.
carbōnas præcipitātus, do.
ſuper-carbōnāti aqua, ℔ i, *daily*.
ſulphas, gr i to v.
et potaſſæ tartris, gr x to ʒ ſs.
et ammōniæ murĭas, gr iij to xv.
murĭatis tinctūra, gt x to xx.
et ammōniæ tinctura, gt xv to ʒ i.
vinum, ʒ ij to vj.
acetāti tinctura, gt x to xxx.
Ferŭlæ aſſæ fœtĭdæ gummi resīna, gr x to ʒ ſs.
lac, ℥ ſs to ℥ i ſs.
tinctura, ʒ ſs to ʒ i.
pilŭlæ compoſĭtæ, gr x to xx.
Fici carĭcæ fructus, No. vi, *in decoction.*
Fraxĭni orni ſuccus concrētus (*manna*), ℥ ſs to i ſs.
ſucci concreti ſyrupus ℥ i to ℥ ij.
Fumārĭæ officinālis herba, ℥ i to ℥ ii *of the expreſſed juice.*
Gentiānæ lutĕæ radix, gr x to ℈ ij.
infūſum compoſitum, ℥ ſs to ij.
tinctūra compoſita, ʒ i to iij.
vinum compoſitum, ℥ ſs to ℥ i.
extractum, gr x to ℈ ij.
Geoffrææ inermis cortex, ℈ i to ij.
decoctum, ℥ i.
Glycyrrhīzæ glabræ radix, ʒ ſs to i.
extractum, ʒ i to iij.
trochiſci, ʒ i to ij.
trochiſci cum opio, ʒ i *during the day.*

Gratiŏlæ officinālis herba, gr x to ℈ i.
Guāiăci officinālis resīna, gr x to ʒ ſs.
tinctūra, ʒ ij to ℥ ſs.
tinctūra ammōniăta, ʒ i to ij.
decoctum compoſitum, ℥ iv to vj.
Hæmatoxȳli Campechiāni extractum, ℈ i to ij.
Hellĕbŏri nigri radix, gr x to ℈ i.
extractum, gr v to gr x.
tinctura, ʒ ſs to iſs.
fœtĭdi folia, ℈ i to ij.
Hordĕi diſtĭchi decoctum, ℥ ij to vj.
compoſitum, ℥ iij to vj.
Hydrargȳrum purificatum, ℥ ij to iv.
cum crēta, gr x to ʒ ſs.
Hydrargȳri oxidum cinereum, gr i to gr v.
pilŭlæ, gr v to xv.
oxĭdum rubrum, gr ſs.
ſub-ſulphas, gr i to gr v.
ſub-murĭas, gr i to gr v.
præcipitātus, do.
acētis, gr i to vj.
murĭas, gr ⅛ to ½.
ſulphurētum nigrum, ℈ i to ʒ i.
rubrum, gr x to ʒ ſs.
Hyoſciămi nigri herba, ſemen, gr iij to gr x.
ſuccus ſpiſſatus, gr i to v.
tinctura, ℈ i to ʒ i.
Hyperĭci perforāti flores, ℈ i to ʒ i.
Hyſſōpi officinālis herba, ℈ i to ʒ i.
Inŭlæ hĕlĕnii radix, ℈ i to ʒ i.
Irĭdis florentīnæ radix, ℈ i to ʒ i.
pſeudăcŏri radicis ſuccus expreſſus, gr lx to lxxx.
Iſis nobĭlis (corallium), gr x to ʒ i.
Juglandis regiæ fructus immatūrus, *externally in decoction.*
Junĭpĕri commūnis baccæ, ʒ ſs to i.
oleum volatile, gtt ij to x.
ſpiritus compoſitus, ʒ ij to vi.
Juniperi lycĭæ gummi reſina (Olĭbănum) ℈ i to ij.
Juniperi ſabīnæ folia, gr xv to ℈ ij.
extractum, gr x to ʒ ſs.
tinctura compoſita, gr xxx to ʒ i.
Kīno, gr x to ℈ i.
tinctura, ʒ i to iij.
Lactūcæ virōſæ ſuccus ſpiſſātus, gr iij to xv.
Lauri cinnamōmi cortex, gr v to ℈ i.
aqua deſtillata, ℥ i to iij.
ſpiritus, ʒ ij to ℥ i.

Lauri cinnamōmi tinctura, ʒ i to ℥ iij.
tinctura compoſita, ʒ ſs to ij.
oleum volatile, g^{tt} i to iij
Laurus caſſia, *conſiderably weaker than the preceding ſpecies, in other reſpects ſimilar.*
Lauri camphŏræ camphora, g^{r} iij to ℈ i.
emulſio, ℥ ſs to ij.
acidum acetōſum; *odour analeptic.*
nobĭlis folia, baccæ, g^{r} x to ʒ ſs.
ſaſſăfras lignum, radix, eorumque cortex, ℈ i to ʒ i.
oleum volatile, g^{t} ij to g^{t} x.
Lavandŭlæ ſpicæ florentes, ℈ i to ʒ i.
ſpirĭtus, *an analeptic perfume.*
ſpirĭtus composĭtus, ʒ ſs to ij.
oleum volatile, g^{t} i to v.
Leontŏdi taraxăci radix, herba, ℥ i to ij *of the juice.*
Lilii candidi radix, *externally as a poultice.*
Līni uſitatiſſimi ſemina, *in infuſion* ℥ i *to water* ℔ i.
oleum fixum, ℥ ſs to i; *or, in clyſters,* ℥ iij to vj.
Lini cathartĭci herba, ʒ i, *or an infuſion of a handful of the freſh plant.*
Lobēliæ ſyphilitĭcæ radix, ℥ ſs, *boiled in* ℔ xij *of water to* ℔ viij; *half a pint twice a-day.*
Magnēſĭa, g^{r} x to ℈ i.
Magneſiæ carbōnas, ℈ i to ʒ i.
trochiſci, ʒ i to ij.
ſulphas, ℥ ſs to ℥ i.
Malvæ ſylveſtris folia; flores, ʒ ſs to i.
Marrŭbĭi vulgāris herba, ʒ ſs to i.
Mel deſpumātum, ʒ ij to ℥ i, *in clyſters* ℥ iij.
acetatum, ʒ i to ij.
Melăleucæ leucădendri oleum volatile, g^{t} i to v
Meliſſæ officinālis herba, g^{r} x to ℈ ij.
Melŏes veſīcatorii pulvis, g^{r} ſs to i.
tinctura, g^{t} x to xxx.
Menthæ virĭdis herba, g^{r} x to ʒ i.
aqua, ℥ i to ij.
ſpiritus, ʒ ij to ℥ i.
oleum volatile, g^{t} ij to v.
piperītæ herba, g^{r} x to ℈ ij.
aqua, ℥ i to ij.
ſpiritus, ʒ ij to ℥ i.
oleum volatile, gt i to g^{t} iij.
pūlĕgĭi herba, g^{r} x to ℈ ij.
aqua, ℥ i to ij.
ſpiritus, ʒ ij to ℥ i.
oleum volatile, g^{t} ij to v.
Menўanthis trĭfoliātæ herba, ʒ ſs to ℥ i.

Mimōſæ catĕchu extractum, gr xv to ʒ ſs.
electuārium, ℈ i to ʒ i.
infuſum, ℥ i to ij.
tinctura, ʒ i to iij.
nilotĭcæ gummi, ʒ i to ij.
emulſio, ℔ ij *daily*.
mucilāgo, ℥ ſs.
Momordĭcæ elaterĭi ſuccus ſpiſſatus, gr ſs to gr vj.
Mori nigræ ſyrupus, ʒ i to ℥ ſs.
Moſchus, gr v to ℈ i.
Moſchi tinctura, ʒ i to ℥ ſs.
miſtūra, ℥ ſs to iſs.
Murĭas ammoniæ, gr x to ʒ ſs.
Murĭas ſodæ, ʒ iij to ℥ ſs, *in clyſters*.
Myrīſtĭcæ moſchātæ fructus nucleus, gr v ad ℈ i.
oleum volatile, gt ij ad gt v.
ſpiritus, ʒ ij ad ℥ i.
nŭcis involucrum, macis, dictum.
involucri oleum expreſſum, *externally*.
Myroxȳli peruiferi balſamum, gr v to ʒ ſs.
tinctura, ʒ ſs to ʒ i.
Myrrha, gr x to ʒ ſs.
Myrrhæ tinctura, ʒ ſs to iſs.
pulvis compoſitus, gr xv to ℈ ij.
Myrti pimentæ fructus, gr v to ℈ i.
aqua deſtillata, ℥ i to iij.
ſpiritus, ʒ ij to ℥ i.
oleum volatile, gt iij to v.
Nicotiānæ tabāci folia, gr ſs to v.
vinum, gt xxx to gt lxxx
Oleæ Europeæ oleum fixum, ʒ iij to ℥ i.
Oleum animale, gt x to xl.
vini, gt i to iv.
Oniſci aſelli (Millepĕdæ) præparati, ʒ i to ij.
Opĭum, gr ſs to gr ij.
Opĭi pilulæ, gr v to ℈ i.
tinctura, gr xx to xl.
ammoniāta, ʒ ſs to ij.
camphorāta, ʒ ſs to ij.
Orīgăni vulgāris herba, gr x to ℈ i.
oleum volatile, gt i to ij.
majorānæ herba, ℈ i to ʒ i.
Oſtrĕæ edulis teſtæ præpărātæ, ʒ ſs to i.
Ovis ariĕtis ſēvum præpărātum, *externally*.
Oxalis acētōſĕllæ folia, ℥ ſs to iſs *of the juice*.
conſerva, ʒ ij to ℥ ſs.
Pæneæ ſarcŏcŏllæ gummi reſina (ſarcocolla), gr x to ʒ ſs.

Panăcis quinquefolii radix, ℈ i to ʒ i.
Papāveris rhœæ flores, ʒ i *in decoction.*
ſyrupus, ʒ i to iij.
Papāveris ſomniferi ſyrupus, ℥ ſs to i *to adults*; ʒ i to ij *to children:* one ounce *is ſuppoſed to contain one grain of opium.*
extractum, gr i to v.
ſuccus ſpiſſatus (Opium) gr ſs to gr ij.
Parietārĭæ officinalis herba, gr x to ʒ i, or ℥ i to iij *of the juice.*
Paſtinācæ opŏpŏnăcis gummi reſina, gr x to ʒ ſs.
Phaſiāni galli ovōrúm teſtæ præpărātæ, ʒ ſs to i.
Phyſetĕris macrocephăli ſevum (ſpermăcēti), ʒ ſs to i ſs.
Pimpĭnellæ anīsi ſemĭna, gt xv to ʒ ſs.
ſpirĭtus compoſĭtus, ʒ ij to ℥ i.
olĕum volatĭle, gt v to gt x.
Pini balsămeæ terebinthĭna (Balſamum Canadenſe), gr v to ʒ ſs.
larĭcis terebinthĭna (Terebinthĭna vĕnĕta), ℈ i to ij; *and in clyſters,* ℥ ſs to i.
ſylveſtris terebinthĭna (Terebinthĭna vulgāris), gt xv to ℈ ij; *and in clyſters,* ℥ ſs to i.
reſina empyreumatica (Pix liquida), ℈ i to ʒ i.
oleum volatile (Oleum terebinthinæ) rectificatum, gt x to ʒ i.
Pipĕris nigri baccæ, gr v to ℈ i.
cubebæ baccæ, gr v to ℈ i.
longi fructus, gr v to ℈ i.
Piſtacĭæ lentĭſci reſina (Maſtĭche), gr v to ʒ ſs.
terĕbinthi (Terebinthina Chia), ℈ i to ʒ i.
Plumbi acetis, gr ſs to ij.
Polygălæ ſenĕgæ radix, ℈ i to ʒ ſs.
decoctūm, ℥ i to ij.
Poly̆gŏni biſtortæ radix, gr xv to ʒ i.
Poly̆podii filĭcis māris radix, ʒ i to ʒ ij.
Potaſſæ aqua, gt x to xxx.
acētis, ℈ i to ℈ ij.
ſuper-carbōnātis aqua, ℥ vj to ℔ ſs.
ſulphurētum, gr v to xv.
tartris, ℈ i to ℥ ſs.
ſuper-tartris, ʒ i to ℥ i.
ſulphas, ℈ i to ℥ ſs.
carbonas, gr v to ℈ i.
carbonātis aqua, ʒ ſs to ʒ i.
nitras, gr v to ʒ ſs.
nitrātis trochiſci, ʒ i to ij.
ſulphas cum ſulphŭre, gr. xv to ʒ ſs.
Potentillæ reptantis radix, ʒ ſs to i.
Prūni domeſtĭcæ fructus, ℥ ij to iij, *ſtewed.*
ſpinōſæ fructus.
conſerva, ʒ ij to ℥ ſs.

Pterŏcarpi dracōnis reſīna, g^{r} x to ℈ ij.

Pulvis aromaticus, g^{r} v to g^{r} x.

opiātus, g^{r} v to g^{r} x.

Pūnĭcæ granāti fructus cortex, ℈ i to ʒ i.

floris petala, ʒ ſs to iſs.

Quaſſiæ ſimarūbæ cortex, ʒ ſs to i; *or,* ʒ ij *in decoction.*

excelſæ lignum, g^{r} v to ℈ i; *or,* ℥ i to ij *of an infuſion of* ʒ ij *in* ℔ i *water.*

Quercus robŏris cortex, g^{r} xv to ʒ ſs; *or,* ℥ i to ij *of an infuſion of* ʒ ij *in* ℔ i *water.*

Quercus cerris gallæ, g^{r} x to ʒ ſs.

Rhamni cathartici ſuccus expreſſus, ℥ ſs to i.

ſyrūpus, ℥ ſs to iſs.

Rhei palmāti radix, g^{r} x to ℈ ij.

infuſum, ℥ ſs to iſs.

pilŭlæ compoſitæ, g^{r} x to ʒ ſs.

tinctura, ℥ ſs to i ſs; *or, as a ſtomachic,* ʒ ij to ℥ ſs.

compoſita, ℥ ſs to i ſs.

cum aloe, ℥ ſs to i.

cum gentiana, ℥ ſs to iſs; *or,* ʒ ij to ℥ ſs, *as a ſtomachic.*

vinum, ℥ ſs to i ſs.

Rhŏdŏdendri chryſānthi folia, g^{r} v to x; *or an infuſion of* ʒ ij *in* ℥ x *of water.*

Rhi toxicodendri folia, g^{r} ſs to i.

Ribis nigri ſuccus ſpiſſatus, ℥ ſs to i.

ſyrupus, ʒ i to ℥ ſs.

Ricĭni commūnis oleum expreſſum, ℥ ſs to ℥ i.

Roſæ gallicæ petala, ℈ i to ʒ i.

conſerva, ʒ ij to ℥ ſs.

infūſum, ℥ ij to vj.

ſyrūpus, ʒ i to ij.

mel, ʒ i to ij.

Roſæ Damaſcēnæ petala, ℈ i to ʒ i.

aqua deſtillata, ℥ i to iij.

ſyrupus, ʒ ij to ℥ ſs.

caninæ (Cynoſbatus) conſerva, ʒ ij to vj.

Roris marīni officinālis ſummitates, g^{t} x to ℈ ij; *and in infuſion* ʒ i to i ſs.

oleum volatile, g^{tt} ij to g^{t} v.

ſpiritus.

Rŭbĭæ tinctōrum radix, ℈ i to ʒ ſs.

Rŭbi idæi ſyrupus, ʒ i to ſs.

Rumĭcis acetōſæ folia, ℥ i to ℥ ij *of the juice.*

Rūtæ grăvĕŏlentis herba, g^{r} xv to ℈ ij.

extractum, g^{r} x to ℈ i.

Sagapēnum gummi reſina, g^{r} x to ʒ ſs.

Salicis fragĭlis cortex, ℈ i to ʒ i.
Salvĭæ officinālis folia, g^{r} xv to ℈ ij.
Sambūci nigri cortex interior, g^{r} v to ℈ i.
ſuccus ſpiſſatus, ℥ ſs to i ſs.
Sapo, g^{r} x to ʒ ſs.
Scillæ maritĭmæ radix recens, g^{r} v to g^{r} xv.
radix ſiccāta, g^{r} i to g^{r} iij.
ſyrūpus, ʒ i to ij.
mel, ʒ ſs to ij.
oxymel, ʒ ſs to ij.
acētum, ʒ ſs to ʒ iſs.
conſerva, ʒ ſs to i.
tinctura, g^{tt} x to 4x.
pilulæ, g^{r} x to ℈ i.
Sināpĕos albæ ſemina, ℥ ſs to ℥ i.
oleum fixum, ℥ ſs to i.
Sīi nodiflōri herba, ℥ ij *or* iij *of the juice.*
Siſymbrĭi naſturtĭi herba, ℥ i *or* ij *of the juice.*
Smilācis ſărſăparīllæ radix, ℈ i to ʒ ſs.
decoctum, ℥ iv to ℔ ſs.
compoſitum, ℥ iv to ℔ ſs.
Sodæ carbōnas, g^{r} x to ʒ ſs.
ſuper-carbōnātis aqua, ℥ iv to ℔ ſs.
et potaſſæ tartris, ʒ vj to ℥ i ſs.
ſulphas, ℥ ſs to iſs.
phoſphas, ℥ ſs to iſs.
murĭas, ʒ iij to ℥ ſs, *in glyſters.*
ſub-boras, g^{r} x to ʒ ſs.
Solāni dulcamāræ ſtipites, ʒ ſs to ʒ i in infuſion.
Spartĭi ſcoparĭi ſummitātes, ℈ i to ʒ i.
extractum, ʒ ſs to i.
Spigēliæ marilandĭcæ radix, ʒ ſs to ℈ ij.
Spirĭtus æthĕris ſulphurĭci composĭtus, ʒ ſs to iſs.
nitroſi, ʒ ſs to ʒ i.
Spongĭa uſta, ʒ ſs to i.
Stalagmitĭdis cambogiodis ſuccus ſpiſſatus, (Gambogia) g^{r} v to g^{r} x.
Stanni pulvis et limatura, ʒ i to ij.
Styrăcis officinālis balſāmum, g^{r} x to ʒ ſs.
benzoini balſămum, g^{r} x to ʒ ſs.
tinctūra compoſita, ʒ ſs to i.
Succĭnum præparātum, ℈ i to ʒ i.
Succĭni oleum rectificātum, g^{t} x to xx.
ſulphas alūminæ, ℈ ſs to ℈ i.
Sulphur præcipitātum, ʒ i to iij.
ſublimātum lotum, ℈ i to ʒ i.
Sulphūris trŏchīſci, ʒ i to iij.

Swietenĭæ mahāgŏni cortex, ℈ i to ij.
febrifŭgæ cortex, ℈ i to ij.
Tamărindi indĭcæ fructus, ℥ ſs to iſs.
infūſum cum caſſia ſenna, ℥ ij to iv.
Tanacēti vulgāris herba, ʒ ſs to i.
Teucrĭi māri herba, g^r x to ʒ ſs.
ſcordĭi herba, ℈ i to ʒ i.
Toluifĕræ balſămi balſămum, g^t xv to ℈ ij.
ſyrūpus, ʒ i to iij.
tinctura, ʒ ſs to ij.
Tormentīllæ erectæ rādix, ℈ i to ij.
Tuſſilăgĭnis farfăræ herba, ℥ ij to iv *of the expreſſed juice.*
Ulmi campeſtris cortex interior, ℈ i to ʒ i.
decoctum, ℥ iv to ℔ ſs.
Urtīcæ dioicæ herba, ℥ i to ij *of the expreſſed juice.*
Valeriānæ officinalis radix, ℈ i to ʒ i.
tinctura, ʒ ij to ℥ ſs.
ammoniata, ʒ i to ij.
extractum.
Verātri albi radix, g^r v to ℈ i.
tinctura, g^t v to x.
Veronicæ beccabungæ herba, ℥ ij to iv *of the juice daily.*
Viŏlæ odorātæ ſyrupus, ʒ i to ij.
Wintĕræ aromaticæ cortex, g^r x to ℈ i.
Zinci oxĭdum, g^r iij to x.
ſulphas, g^r vj to ʒ ſs.

N. B. Theſe are in general the doſes for adults from twenty to ſixty, but they may be diminiſhed for children and people paſt the prime of life, nearly in the following proportions,

	Ages.	Proportionate doſes.
Months	2	$\frac{1}{15}$
	7	$\frac{1}{12}$
	14	$\frac{1}{8}$
	28	$\frac{1}{5}$
Years	3	$\frac{1}{4}$
	5	$\frac{1}{3}$
	7	$\frac{1}{2}$
	14	$\frac{2}{3}$
	63	$\frac{11}{12}$
	77	$\frac{5}{6}$
	100	$\frac{4}{6}$

It may alſo be obſerved, that ſixty drops of water, one hundred of diluted alcohol, or an hundred and twenty of alcohol, are equal to a drachm by meaſure.

TABLE of Names changed in the last Edition of the London Pharmacopœia.

Names changed.	*New Names.*
A.	
ACETUM ſcilliticum.	Acetum ſcillæ.
Æthiops mineralis.	Hydrargyrus cum ſulphure.
Aqua aluminoſa bateana.	Aqua aluminis compoſita.
calcis ſimplex.	calcis.
cinnamomi ſimplex.	cinnamomi.
ſpirituoſa.	Spiritus cinnamomi.
fortis.	Acidum nitroſum dilutum.
hordeata.	Decoctum hordei.
juniperi compoſita.	Spiritus juniperi compoſitus.
menthæ piperitidis ſimplex.	Aqua menthæ piperitidis.
ſpirituoſa.	Spiritus menthæ piperitidis.
vulgaris ſimplex.	Aqua menhæ ſativæ.
ſpirituoſa.	Spiritus menthæ ſativæ.
nucis moſchatæ.	nuclei fructus myriſticæ, ſive nucis moſchatæ.
piperis Jamaicenſis.	Aqua pimento.
pulegii ſimplex.	pulegii.
ſpirituoſa.	Spiritus pulegii.
raphani compoſita.	raphani compoſitus.
roſarum damaſcenarum.	Aqua roſæ.
ſapphirina.	cupri ammoniati.
ſeminum anethi.	anethi.
aniſi compoſita.	Spiritus aniſi compoſitus.
carui.	carui.
vitriolica camphorata.	Aqua zinci vitriolati cum camphora.
Argenti vivi urificatio.	Hydrargyri purificatio.
Axungiæ porcinæ curatio.	Adipis ſuillæ præparatio.

Names changed.	*New Names.*
B.	
Balſamum ſulphuris barbadenſe.	Petroleum ſulphuratum.
ſimplex.	Oleum ſulphuratum.
traumaticum.	Tinctura benzoës compoſita.
C.	
Calx antimonii.	Antimonium calcinatum.
Cataplaſma e cymino.	Cataplaſma cumini.
Cauſticum antimoniale.	Antimonium muriatum.
commune fortius.	Calx cum kali puro.
lunare.	Argentum nitratum.
Ceratum album.	Ceratum ſpermatis ceti.
citrinum.	reſinæ flavæ.
epuloticum.	lapidis calaminaris.
Chalybis rubigo præparata.	Ferri rubigo.
Cinnabaris factitia.	Hydrargyrus ſulphuratus ruber.
Coagulum aluminoſum.	Cataplaſma aluminis.
Confectio cardiaca.	Confectio aromatica.
Cornu cervi calcinatio.	Cornu cervi uſtio.
D.	
Decoctum album.	Decoctum cornu cervi.
commune pro clyſtere.	pro enemate.
corticis peruviani.	cinchonæ ſive corticis peruviani.
pectorale.	hordei compoſitum.
E.	
Electarium lenitivum.	Electuarium ſennæ.
Elixir aloës.	Tinctura aloës compoſita.
myrrhæ compoſitum.	ſabinæ compoſita.
paregoricum.	opii camphorata.
Emplaſtrum ex ammoniaco cum mercurio.	Emplaſtrum ammoniaci cum hydrargyro.
Emplaſtrum attrahens.	Emplaſtrum ceræ compoſitum.
cephalicum.	picis burgundicæ compoſitum.
commune.	lithargyri.
adhæſivum.	cum reſina.
commune cum gummi.	lithargyri compoſitum.
commune cum mercurio.	lithargyri cum hydrargyro.
e cymino.	cumini.
roborans.	thuris compoſitum.
e ſapone.	ſaponis.
ſtomachicum.	ladani compoſitum.
veſicatorium.	cantharidis.
Emulſio communis.	Lac amygdalæ.

Names changed.	*New Names.*
Extractum catharticum.	Extractum colocynthidis compoſitum.
ligni campechenſis.	hæmatoxyli ſive ligni campechiani.
corticis peruviani.	cinchonæ ſive corticis peruviani.
thebäicum ſive opium colatum.	Opium purificatum.
F.	
Flores benzöini.	Flores benzoës.
martiales.	Ferrum ammoniacale.
Fotus communis.	Decoctum pro fomento.
H.	
Hiera picra.	Pulvis aloës cum canella.
I.	
Infuſum amarum ſimplex.	Infuſum gentianæ compoſitum.
ſenæ communis.	ſennæ tartariſatum.
Julepum e camphora.	Miſtura camphorata.
e creta.	cretacea.
e moſcho.	moſchata.
L.	
Linimentum album.	Unguentum ſpermatis ceti.
ſaponaceum.	Linimentum ſaponis.
volatile.	ammoniæ.
Lixivium ſaponarium.	Aqua kali puri.
tartari.	kali præparati.
M.	
Mel ægyptiacum.	Oxymel æruginis.
roſaceum.	Mel roſæ.
Mercurius calcinatus.	Hydrargyrus calcinatus.
corroſivus ſublimatus.	muriatus.
ruber.	nitratus ruber.
dulcis ſublimatus.	Calomelas.
emeticus flavus.	Hydrargyrus vitriolatus.
præcipitatus albus.	Calx hydrargyri alba.
N.	
Nitrum vitriolatum.	Kali vitriolatum.
O.	
Oleum petrolei barbadenſis.	Oleum petrolei.
terebinthinæ æthereum.	terebinthinæ rectificatum.
Opium colatum.	Opium purificatum.
Oxymel ſcilliticum.	Oxymel ſcillæ.
ſimplex.	Mel acetatum.

Names changed.	*New Names.*
P.	
Philonium londinenſe.	Confectio opiata.
Pilulæ aromaticæ.	Pulvis aloëticus cum guaiaco.
ecphracticæ.	aloës cum ferro.
gummoſæ.	Pilulæ Galbani compoſitæ.
rufi.	aloës cum myrrha.
Pulvis e bolo compoſitus.	Pulvis cretæ compoſitus.
cum opio.	cum opio.
e ceruſſa compoſitus.	ceruſſæ.
e chelis cancrorum compoſitus.	cancri chelarum compoſitus.
ſternutatorius.	aſari compoſitus.
R.	
Rob baccarum ſambuci.	Succus baccæ ſambuci ſpiſſatus.
S.	
Saccharum ſaturni.	Ceruſſa acetata.
Sal abſinthii.	Kali præparatum.
catharticus amarus.	Magneſia vitriolata.
glauberi.	Natron vitriolatum.
diureticus.	Kali acetatum.
martis.	Ferrum vitriolatum.
tartari.	Kali præparatum.
vitrioli.	Zincum vitriolatum.
volatilis ſalis ammoniaci.	Ammonia præparata.
Species aromaticæ.	Pulvis aromaticus.
Spiritus cornu cervi.	Liquor volatilis cornu cervi.
lavendulæ ſimplex.	Spiritus lavendulæ.
nitri dulcis.	ætheris nitroſi.
glauberi.	Acidum nitroſum.
ſalis ammoniaci.	Aqua ammoniæ.
ſalis ammoniaci dulcis.	Spiritus ammoniæ.
ſalis marini glauberi.	Acidum muriaticum.
vinoſus camphoratus.	Spiritus camphoratus.
vitrioli dulcis.	ætheris vitriolici.
volatilis aromaticus.	ammoniæ compoſitus.
fœtidus.	fœtidus.
Succi ſcorbutici.	Succus cochleariæ compoſitus.
Syrupus ex althæa.	Syrupus althææ.
e corticibus aurantiorum.	corticis aurantii.
balſamicus.	tolutanus.
e meconio.	papaveris albi.
roſarum ſolutivus.	roſæ.
T.	
Tabellæ cardialgicæ.	Trochiſci cretæ.
Tartarum emeticum.	Antimonium tartariſatum.
ſolubile.	Kali tartariſatum.

Names changed.	*New Names.*
Tartarum vitriolatum.	Kali vitriolatum.
Tinctura amara.	Tinctura gentianæ compoſita.
aromatica.	cinnamomi compoſita.
corticis peruviani ſimplex.	cinchonæ ſive corticis peruviani.
corticis peruviani volatilis.	cinchonæ, ſive corticis peruviani, ammoniata.
fœtida.	aſſæ fœtidæ.
florum martialium.	ferri ammoniacalis.
guaiacina volatilis.	guaiaci.
japonica.	catechu.
martis in ſpiritu ſalis.	ferri muriati.
melampodii.	hellebori nigri.
rhabarbari ſpirituoſa.	rhabarbari.
vinoſa.	Vinum rhabarbari.
roſarum.	Infuſum roſæ.
ſacra.	Vinum aloës.
ſtomachica.	Tinctura cardamomi compoſita.
thebaïca.	opii.
valerianæ volatilis.	valerianæ ammoniata.
Trochiſci bechici albi.	Trochiſci amyli.
nigri.	glycyrrhizæ.
V.	
Vinum antimoniale.	Vinum antimonii.
chalybeatum.	ferri.
Unguentum album.	Unguentum ceræ.
baſilicum flavum.	reſinæ flavæ.
cæruleum fortius.	hydrargyri fortius.
cæruleum mitius.	hydrargyri mitius.
e gummi elemi.	elemi compoſitum.
e mercurio præcipitato.	calcis hydrargyri albæ.
ſaturninum.	ceruſſæ acetatæ.
ſimplex.	adipis ſuillæ.
ad veſicatoria.	cantharidis.

TABLE of Names changed, and of some Synonimes, in the last Edition of the Edinburgh Pharmacopœia.

Names changed.	*New Names.*
A.	
ABSINTHIUM.	ARTEMISIA abſinthium.
Acetoſa.	Rumex acetoſa.
Acetum vini.	Acidum acetoſum.
Acidum vitriolicum.	ſulphuricum.
vitrioli aromaticum.	aromaticum.
Ærugo.	Sub-Acetis cupri.
Æther vitriolicus.	Æther ſulphuricus.
Æthiops mineralis.	Sulphuretum hydrargyri nigrum.
Agaricus.	Boletus igniarius.
Alkali cauſticum.	Potaſſa.
fixum foſſile.	Carbonas ſodæ.
vegetabile.	potaſſæ impurus.
volatile.	ammoniæ.
Alumen.	Sulphas aluminæ.
uſtum.	exſiccatus.
Ammonia muriata.	Murias ammoniæ.
præparata.	Carbonas ammoniæ.
Amygdala dulcis.	Amygdalus communis.
Angelica ſativa.	Angelica Archangelica.
Aniſum.	Pimpinella aniſum.
Antimonium.	Sulphuretum antimonii.
calcareo-phoſphoratum.	Oxidum antimonii cum phoſphate calcis.
muriatum.	Murias antimonii.
tartariſatum.	Tartris antimonii.
Aqua ammoniæ.	Aqua carbonatis ammoniæ.
acetatæ.	acetitis ammoniæ.
cauſticæ.	ammoniæ.
cupri vitriolati compoſita, *vel* aqua ſtyptica.	Solutio ſulphatis cupri compoſita.
lixiviæ cauſticæ.	Aqua potaſſæ.
zinci vitriolati.	Solutio ſulphatis zinci.
Arabicum gummi.	Gummi mimoſæ niloticæ.
Argentum nitratum.	Nitras argenti.
Arſenicum.	Oxidum arſenici.

Names changed.	*New Names.*
Aſſa fœtida.	Gummi-reſina ferulæ aſſæ fœtidæ.
Aurantium Hiſpalenſe.	Citrus aurantium.
B.	
Balſamum Canadenſe.	Reſina pini balſameæ.
Copaibæ.	copaiferæ officinalis.
Gileadenſe.	amyridis Gileadenſis.
Peruvianum.	Balſamum myroxyli peruiferi.
Tolutanum.	toluiferæ balſami.
traumaticum.	Tinctura benzoës compoſita.
Bardana.	Arctium lappa.
Barilla.	Carbonas ſodæ impurus.
Barytes.	barytæ.
Belladonna.	Atropa belladonna.
Benzoinum.	Balſamum ſtyracis benzoës.
Biſtorta.	Polygonum biſtorta.
Borax.	Boras ſodæ.
Butyrum antimonii.	Murias antimonii.
C.	
Cajeputa.	Melaleuca leucadendron.
Calamus aromaticus.	Acorus calamus.
Calomelas.	Sub-Murias hydrargyri.
Calx viva.	Calx.
Cancrorum lapilli.	Carbonas calcis præparatus.
Cantharis.	Meloë veſicatorius.
Cardamomum minus.	Amomum repens.
Carduus benedictus.	Centaurea benedicta.
Carica.	Fructus ficûs caricæ.
Carvi.	Carum carvi.
Caryophylla aromatica.	Caryophyllus aromaticus.
rubra.	Dianthus crayophyllus.
Caſcarilla.	Croton eleutheria.
Caſſia fiſtularis.	Caſſia fiſtula.
lignea.	Laurus caſſia.
Catechu.	Extractum mimoſæ catechu.
Cauſticum commune acerrimum.	Potaſſa.
mitius.	cum calce.
lunare.	Nitras argenti.
Centaurium minus.	Gentiana centaurium.
Ceruſſa.	Oxidum plumbi album.
acetata.	Acetis plumbi.
Chamæmelum.	Anthemis nobilis.
Cicuta.	Conium maculatum.
Cinnabaris factitia.	Sulphuretum hydrargyri rubrum.
Cinara hortenſis.	Cinara ſcolymus.
Cineres clavellati.	Carbonas potaſſæ impurus.
Cinnamomum.	Laurus cinnamomum.
Coccinella.	Coccus cacti.
Colocynthis.	Cucumis colocynthis.

Names changed.	*New names.*
Confectio japonica.	Electuarium catechu.
Contrayerva.	Dorſtenia contrayerva.
Cortex peruvianus.	Cortex cinchonæ officinalis.
Creta alba.	Carbonas calcis.
Crocus antimonii. } metallorum. }	Oxidum antimonii cum ſulphure per nitratem potaſſæ.
Cryſtalli tartari.	Super-Tartris potaſſæ.
Cucumis agreſtis.	Fructus recens momordicæ elaterii.
Cuprum ammoniacum.	Ammoniaretum cupri.
vitriolatum.	Sulphas cupri.
Cynoſbatos.	Fructus recens roſæ caninæ.
D.	
Daucus ſilveſtris.	Daucus carota.
Decoctum chamæmeli *vel* commune.	Decoctum anthemidis nobilis.
lignorum.	guaiaci officinalis compoſitus.
Dens leonis	Leontodon taraxacum.
E.	
Elaterium.	Succus ſpiſſatus momordicæ elaterii.
Electuarium lenitivum.	Electuarium caſſiæ ſennæ.
Elixir paregoricum.	Tinctura opii ammoniata.
ſacrum.	rhei cum aloë.
ſalutis.	caſſiæ ſennæ compoſita.
ſtomachicum.	gentianæ compoſita.
Emplaſtrum adhæſivum.	Emplaſtrum reſinoſum.
cereum.	ſimplex.
lithargyri *vel* commune.	oxidi plumbi ſemivitrei.
lithargyri compoſitum *vel* roborans.	oxidi ferri rubri.
veſicatorium.	meloës veſicatorii.
Emulſio communis.	Emulſio amygdalæ communis.
F.	
Ferri rubigo.	Carbonis ferri.
ſquamæ purificatæ.	Ferri oxidum nigrum purificatum
præparatæ.	præparatum.
Ferrum ammoniatum.	Murias ammoniæ et ferri.
vitriolatum.	Sulphas ferri.
uſtum.	Oxidum ferri rubrum.
Filix mas.	Polypodium filix mas.
Flores martiales.	Murias ammoniæ et ferri.
ſulphuris.	Sulphur ſublimatum.
zinci.	Oxidum zinci.
Fœniculum dulce.	Anethum fœniculum.

Names changed.	*New names.*
G.	
Galbanum.	Gummi-reſina bubonis galbani.
Geniſta.	Spartium ſcoparium.
Granata malus.	Punica granatum.
H.	
Helleborus albus.	Veratrum album.
Hepar ſulphuris.	Sulphuretum potaſſæ.
Hippocaſtanum.	Æſculus hippocaſtanum.
Hydrargyrus acetatus.	Acetis hydrargyri.
muriatus corroſivus.	Murias hydrargyri.
mitis.	Sub-Murias hydrargyri.
præcipitatus.	præcipitatus.
nitratus ruber.	Oxidum hydrargyri rubrum per acidum nitricum.
præcipitatus cinereus.	Oxidum hydrargyri cinereum.
ſulphuratus niger.	Sulphuretum hydrargyri nigrum.
vitriolatus flavus.	Sub-Sulphas hydrargyri flavus.
I.	
Infuſum amarum.	Infuſum gentianæ luteæ compoſitum.
roſarum.	roſæ Gallicæ.
J.	
Jalapa.	Convolvulus jalapa.
L.	
Lapis calaminaris.	Carbonas zinci impurus.
Lavendula.	Lavandula ſpica.
Laudanum liquidum.	Tinctura opii.
Lignum Campechenſe.	Lignum Hæmatoxyli Campechiani.
Limon.	Fructus citri medicæ.
Linimentum anodynum *vel* opiatum.	Tinctura ſaponis cum opio.
aquæ calcis.	Oleum lini cum calce.
ſaponaceum.	Tinctura ſaponis.
volatile.	Oleum ammoniatum.
Lithargyrus.	Oxidum plumbi ſemivitreum.
Lixiva acetata.	Acetis potaſſæ.
e tartaro.	Carbonas potaſſæ puriſſimus.
purificata.	Carbonas potaſſæ.
tartariſata.	Tartris potaſſæ.
vitriolata.	Sulphas potaſſæ.
ſulphurea.	cum ſulphure.
Lixivium cauſticum.	Aqua potaſſæ.

Names changed.	*New Names.*
M.	
Magneſia alba.	Carbonas magneſiæ.
uſta.	Magneſia.
vitriolata.	Sulphas magneſiæ.
Majorana.	Origanum majorana.
Manna.	Succus concretus fraxini orni.
Maſtiche.	Reſina piſtachiæ lentiſci.
Melampodium.	Helleborus niger.
Mercurius.	Hydrargyrus.
præcipitatus ruber.	Oxidum hydrargyri rubrum.
ſublimatus corroſivus.	Murias hydrargyri.
Mezereum.	Daphne mezereum.
Minium.	Oxidum plumbi rubrum.
Muria.	Murias ſodæ.
N.	
Naſturtium aquaticum.	Siſymbrium naſturtium.
Nitrum.	Nitras potaſſæ.
Nux moſchata.	Nucleus fructûs myriſticæ moſchatæ.
O.	
Olea ſtillatitia.	Olea volatilia.
Oleum ſuccini rectificatum.	Oleum ſuccini puriſſimum.
terebinthinæ rectificatum.	terebinthinæ volatile puriſſimum.
Olibanum.	Gummi-reſina juniperi lyciæ.
Oliva.	Olea Europæa.
P.	
Palma.	Cocos butyracea.
Patroleum Barbadenſe.	Bitumen petroleum.
Petroſelinum.	Apium petroſelinum.
Pilulæ cupri.	Pilulæ ammoniareti cupri.
thebaicæ.	opiatæ.
Pimento *vel* piper Jamaicenſis.	Myrtus pimenta.
Piper Indicum.	Capſicum annuum.
Pix Burgundica.	Reſina pini abietis.
Plumbum uſtum.	Oxidum plumbi ſemivitreum.
Potio cretacea.	Potio carbonatis calcis.
Prunus Gallica.	Prunus domeſtica.
Pulegium.	Mentha pulegium.
Pulvis antimonialis.	Oxidum antimonii cum phoſphate calcis.
cretaceus.	Pulvis carbonatis calcis compoſitus.
Doveri.	ipecacuanhæ et opii.
Pyrethrum.	Anthemis pyrethrum.

Names changed.	*New Names.*
R.	
Raphanus ruſticanus.	Cochlearia armoracia.
Reſina alba.	Reſina pini.
Rhabarbarum.	Rheum palmatum.
Roſa pallida.	Roſa centifolia.
rubra.	Gallica.
Rubigo ferri præparata.	Carbonas ferri præparatus.
S.	
Sabina.	Juniperus ſabina.
Saccharum ſaturni.	Acetis plumbi.
Sal alkalinus fixus foſſilis.	Carbonas ſodæ.
vegetabilis.	potaſſæ.
ammoniacus.	Murias ammoniæ.
catharticus amarus.	Sulphas magneſiæ.
cornu cervi.	Carbonas ammoniæ.
Glauberi.	Sulphas ſodæ.
marinus Hiſpanus.	Murias ſodæ.
polychreſtus.	Sulphas potaſſæ cum ſulphure.
Rupellenſis.	Tartris potaſſæ et ſodæ.
ſuccini.	Acidum ſuccinicum.
tartari.	Carbonas potaſſæ puriſſimus.
Sanguis draconis.	Reſina pterocarpi draconis.
Santalum rubrum.	Pterocarpus ſantalinus.
Santonicum.	Artemiſia ſantonicum.
Sarſaparilla.	Smilax ſarſaparilla.
Saſſafras.	Laurus ſaſſafras.
Scammonium.	Gummi-reſina convolvuli ſcammoniæ.
Seneka.	Polygala ſenega.
Senna.	Caſſia ſenna.
Serpentaria Virginiana.	Ariſtolochia ſerpentaria.
Simarouba.	Quaſſia ſimaruba.
Sinapi album.	Sinapis alba.
Soda.	Carbonas ſodæ.
muriata.	Murias ſodæ.
phoſphorata.	Phoſphas ſodæ.
tartariſata.	Tartris potaſſæ et ſodæ.
vitriolata.	Sulphas ſodæ.
Spiritus ætheris vitriolici.	Æther ſulphuricus cum alcohole.
ammoniæ.	Alcohol ammoniatum.
aromaticus.	aromaticum.
fœtidus.	fœtidum.
cornu cervi.	Aqua carbonatis ammoniæ.
Mindereri.	acetitis ammoniæ.
vinoſus rectificatus.	Alcohol.
tenuior.	dilutum
camphoratus.	Tinctura camphoræ.

Names changed.	*New Names.*
Staphiſagria.	Delphinium ſtaphiſagria.
Stramonium.	Datura ſtramonium.
Sulphur antimonii præcipitatum. auratum antimonii.	Sulphuretum antimonii præcipitatum.
Syrupus balſamicus *vel* Tolutanus.	Syrupus toluiferæ balſami.
papaveris albi.	papaveris ſomniferi.
T.	
Taraxacum.	Leontodon taraxacum.
Tartarus crudus.	Super-Tartris potaſſæ impurus.
Tartari cryſtalli.	potaſſæ.
Tartarum ſolubile.	Tartris potaſſæ.
vitriolatum.	Sulphas potaſſæ.
Tartarus emeticus.	Tartris antimonii.
Terebinthina Veneta.	Reſina pini laricis.
Terra Japonica.	Extractum mimoſæ catechu.
Tinctura aloës vitriolata.	Tinctura aloës ætherea.
aromatica.	lauri cinnamomi compoſita.
ferri.	muriatis ferri.
cantharidum.	meloës veſicatorii.
Japonica.	mimoſæ catechu.
rhei amara.	rhei cum gentiana.
ſacra.	Vinum aloës ſocotorinæ.
Tolutana.	Tinctura toluiferæ balſami.
Toxicodendron.	Rhus toxicodendron.
Tragacantha.	Gummi aſtragali tragacanthæ.
Trifolium.	Menyanthes trifoliata.
Trochiſci Arabici.	Trochiſci gummoſi.
Turpethum minerale.	Sub-Sulphas hydrargyri flavus.
Tutia.	Oxidum zinci impurum.
U.	
Unguentum album *vel* ceruſſæ.	Unguentum oxidi plumbi albi.
æruginis.	ſub-Acetitis cupri.
cœruleum.	hydrargyri.
citrinum.	nitratis hydrargyri.
epiſpaſticum fortius.	pulveris meloës veſicatorii.
mitius.	infuſi meloës veſicatorii.
ſaturninum.	acetitis plumbi.
tutiæ.	oxidi zinci impuri.
Uva paſſa.	Fructus ſiccatus vitis viniferi.
urſi.	Arbutus uva urſi.
V.	
Valeriana ſylveſtris.	Valeriana officinalis.
Vinum amarum.	Vinum gentianæ compoſitum.

Names changed.	*New Names.*
Vinum antimoniale.	Vinum tartritis antimonii.
Vitriolum album.	Sulphas zinci.
cœruleum.	cupri.
viride.	ferri.
Vitrum antimonii.	Oxidum antimonii cum ſulphure vitrificatum.
ceratum.	antimonii vitrificatum cum cera.
W.	
Winteranus cortex.	Cortex Winteræ aromaticæ.
Z.	
Zincum uſtum.	Oxidum zinci.
vitriolatum.	Sulphas zinci.
Zingiber.	Amomum zingiber.

Note.—(*Edin.*) In theſe Indexes of changed names, fearing leſt they might become too long, and ſatisfied if every poſſible error might be avoided, we have only introduced thoſe ſimples of which we have changed the principal and common names, called in natural hiſtory Generic Names; ſuch as Anethum fœniculum for Fœniculum, Anthemis nobilis for Chamæmelum, Gentiana Centaureum for Centaurium minus; but we have omitted all thoſe ſimples whoſe former generic names remain, and to which we have only added their ſpecific or trivial names, ſuch as Digitalis purpurea, Rheum palmatum, Papaver ſomniferum.

For the ſame reaſon, we have thought it ſufficient to introduce into theſe Indexes the changed name of every ſimple, having generally omitted the titles of the preparations and compoſitions which are formed of them. Thus, we have mentioned, that Laurus Cinnamomum is to be uſed in place of Cinnamomum; but we have omitted the Aqua, Spiritus, and Tinctura Lauri Cinnamomi, truſting that their new names cannot be a ſource of doubt or error to any perſon.

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